(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 898 411 B1

# (12) EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention of the grant of the patent:
**21.05.2003 Bulletin 2003/21**

(51) Int Cl.[7]: **H04N 1/00**, H04N 1/06

(21) Application number: **98115687.0**

(22) Date of filing: **20.08.1998**

## (54) Method and apparatus for automatically recording printing plates in an imaging system

Verfahren und Gerät zum automatischen Aufzeichnen von Druckplatten in einem Bilderzeugungssystem

Procédé et appareil d'enregistrement automatique de plaques d'impression dans un système d'imagerie

(84) Designated Contracting States:
**DE FR GB**

(30) Priority: **21.08.1997 US 915844**

(43) Date of publication of application:
**24.02.1999 Bulletin 1999/08**

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(56) References cited:
**EP-A- 0 095 936** **EP-A- 0 551 772**
**GB-A- 2 281 633**

- **PATENT ABSTRACTS OF JAPAN vol. 008, no. 092 (P-271), 27 April 1984 (1984-04-27) & JP 59 007966 A (RICOH KK), 17 January 1984 (1984-01-17)**
- **PATENT ABSTRACTS OF JAPAN vol. 097, no. 006, 30 June 1997 (1997-06-30) & JP 09 030678 A (NEC ENG LTD), 4 February 1997 (1997-02-04)**



EP 0 898 411 B1

Printed by Jouve, 75001 PARIS (FR)

## Description

### TECHNICAL FIELD

**[0001]** The present invention relates to imaging systems such as platesetters and imagesetters and more particularly to imaging systems having automatic loading and unloading of media.

### BACKGROUND ART

**[0002]** Modern imagesetters and platesetters utilize optical scanners to write or record images for subsequent reproduction or to read a prerecorded image at a pre-defined resolution rate. Such scanners may write or record images on or read prerecorded images from various media including photo or thermal sensitive paper or polymer films, photo or thermal sensitive coatings or erasable imaging materials, an aluminum or other base printing plate, or other type of media. The media is typically mounted on an imaging support surface which may be planar or curved and then scanned with an optical beam. The primary components of modern imagesetting and platesetting systems include an image processor, which may be in the form of a personal computer or workstation, to generate and/or edit an image, a raster image processor (RIP) for converting data signals from the image processor into signals which can be understood by an engine or system controller which controls the scanning of the optical beam on the media. The imagesetter or platesetter itself typically includes a writing engine having a scan assembly. The scan assembly may, for example, be disposed and moveable within a drum cylinder in which the recording or recorded media is mounted. The writing engine controller, in accordance with the signals from the RIP and its own programmed instructions, generates signals to control the optical scanning so as to write images on or read images from the media mounted within the drum cylinder by scanning one or more optical beams over the recording media mounted against the inside circumference of the drum cylinder while the cylinder itself remains fixed. A typical scan assembly of a cylindrical drum type imager system may include a spin mirror or other optical device to direct the light beam over the inside circumference of the drum cylinder, as will be well understood by one skilled in the art. Modern imaging systems also typically include a loading device, often referred to as an applicator, for loading media onto and removing media from the media support surface of, for example, the drum cylinder.

**[0003]** Imaging systems may also include other components. Typically, imaging systems include a media storage device for storing the unrecorded media (usually only one size media) to be imaged by the imager, e. g., the imagesetter or platesetter. As described above, the imager records a latent image onto the media, thereby providing a developed or final image. The system often additionally includes a media processor which develops or otherwise processes the final image. If these components are included in the system, the imaging system may also include devices, which may for example be electromechanical assemblies, to deliver the media from the storage device to the imager loading device and from the imager to the media processor. To provide efficient operation, conventional imaging systems load media onto, for example, the internal surface of a cylindrical drum from one side of the drum and remove the imaged media from the other side of the drum. This results in the media having a short travel distance between the media storage device and entry into the cylindrical drum of the imager. To keep this distance as short as possible, designers attempt to locate the media storage device as close as possible to the imager. Accordingly, in operation, the system's media delivery device moves a sheet of media from the storage device to an applicator which inserts the media, leading edge first, onto the support surface of the cylindrical drum from the side of the cylindrical drum closest to the storage device. The applicator moves the media into the desired position on the internal surface of the cylindrical drum prior to imaging by the scan assembly. In order to provide quality imaging, it is imperative that the media to be imaged be properly positioned on the support surface of the imaging system. This is because multiple color separations of the same image are used to record a final image. Therefore, each latent image representing a color must be properly registered with respect to the imaging beam path. Typically prior art registration configurations use a registration device, for example, two registrations pins, to align the leading edge of the media to a registration axis of the imaging system. Preferably, the registration pins should be as far as part as possible while contacting the leading edge to provide a more accurate alignment of the leading edge with respect to the registration axis. However, the registration pins in conventional systems are typically fixed, or moveable with a substantial amount of work required by the operator. Thus, if a job requires different plate sizes, the operator must either set the registration pins sufficiently far apart to properly register the smallest plate size (which results in less than ideal separation of the registration pins for larger plate sizes) or manually change the position of the registration pins which results in lost productivity.

**[0004]** Once the imaging is completed, the applicator removes the imaged media from the internal surface of the cylindrical drum, leading edge first, and out of the far side of the drum to an media delivery device. The media delivery device then continues the movement of the imaged media, leading edge first, to the media processor. The media processor is also typically designed to be located as close as possible to the far side of the cylindrical drum to reduce the distance over which the imaged media travels. The media is then moved into the media processor where development of the imaged media occurs.

**[0005]** In the typical operational sequence of conven-

tional imaging systems, the media delivery device remains in a parked position during the positioning of the media on and removal of the imaged media from the cylindrical drum, as well as during the imaging of the media. Only after the imaged media has been removed from the internal surface of the cylindrical drum, and often only after the imaged media has been removed entirely from the cylindrical drum, does the media delivery device remove another sheet of media from the storage device and deliver it to the loading device. Typically, the imaged media is not removed from the internal surface of the cylindrical drum until the imaged processor has been emptied. More particularly, if another sheet of imaged media is being developed in the media processor, after imaging a sheet of media in the cylindrical drum, the imaged media in the cylindrical drum is not removed from the cylindrical drum until the imaged media being developed in the plate processor is removed from the processor.

**[0006]** Because the movement of the media from the storage device to the media processor in conventional systems proceeds in a single direction, i.e., a single edge of each respective sheet of media leads the movement of the sheet throughout the process, and the single media is loaded into the cylindrical drum from the side of the cylindrical drum closes to the storage device and removed from the side of the cylindrical drum closest to the media processor, the imaged media must be stored emulsion side up. Hence, although it is beneficial to store media with the emulsion side down for numerous reasons which are well known in the art, in conventional systems the media is consistently stored emulsion side up due to the travel path of the media.

**[0007]** GB 2 281 633 discloses a device for the positioning of light-sensitive media on an exposure surface. This device comprises an imaging system comprising a support surface, a registration device, a loading device and an imaging device. The loading device includes a plurality of attaching devices being mounted on a support member of that loading device for attaching a sheet of media near the leading edge. The preamble of claim 1 has been formulated under consideration of the features known from this document.

**[0008]** EP 0 551 772 discloses a scanning apparatus and a method for scanning medium, wherein the medium is supplied to a support means which is either a frame consisting of two disks on an axis or a support layer which is connected to the frame and can be unwound from the frame. In a certain embodiment the medium can be provided to the scanning apparatus by a plate lifting device with vacuum caps holding the medium. These vacuum caps are not movable relative to the plate lifting device, either, and also not in relation to each other.

**[0009]** EP 0 095 936 discloses a device or a method in which a medium is moved and also exposed on a flexible transport.

## OBJECTIVES OF THE INVENTION

**[0010]** According, it is an object of the present invention to provide an imaging system which loads and unloads media with enhanced efficiency.

**[0011]** It is an aspect of the present invention to provide an imaging system which facilitates the loading and unloading of different size media onto a media support surface.

**[0012]** It is another aspect of the present invention to provide an imaging system capable of properly positioning media of differing widths on the media support surface prior to imaging.

**[0013]** It is a further aspect of the present invention to provide an imaging system which ensures proper alignment registration of the media to be imaged with respect to the imaging elements as it is loaded onto the media support surface.

**[0014]** It is another aspect of the present invention to provide an imaging system which will square or deskew the media to be imaged as it is loaded onto the media support surface.

**[0015]** Additional aspects, advantages, novel features of the present invention will become apparent to those skilled in the art from this disclosure, including the following detailed description.

## SUMMARY DISCLOSURE OF THE INVENTION

**[0016]** The above object is solved by an imaging system having the features of claim 1 and a method of imaging comprising the steps of claim 17.

## BRIEF DESCRIPTION OF DRAWINGS

**[0017]**

Figure 1 depicts an imaging system in accordance with the present invention.

Figure 2 depicts an isometric exploded view particularly featuring the applicator shown in Figure 1, in accordance with the present invention.

Figure 3 further details the drive assembly for the applicator shown in Figure 2, in accordance with the present invention.

Figure 4 depicts a schematic view of the cup module of the applicator shown in Figures 1 and 2, in accordance with the present invention.

Figure 4 depicts a schematic view of the cup module of the applicator shown in Figures 1 and 2, in accordance with the present invention.

Figure 5A details the cup module shown in Figure 4, in accordance with the present invention.

Figure 5B and 5C further detail the cup module shown in Figure 5A, in accordance with the present invention.

Figur 5D depicts a partial isometric view of the cup module shown in Figure 4, particularly featuring the

finger members of the suction cups, in accordance with the present invention.

Figure 5E depicts an isometric, exploded view of an individual suction cup assembly, in accordance with the present invention.

Figure 6A details the roller module, in accordance with the present invention.

Figure 7A depicts the delivery of a sheet of media in the Figure 1 system, in accordance with the present invention.

Figure 7B depicts the loading of the sheet of media shown in Figure 7A in the cylindrical drum, in accordance with the present invention.

Figure 7C depicts the registration of the sheet of media shown in Figure 7B and the buffering of another sheet of media, in accordance with the present invention.

Figure 7D details the register assembly shown in Figures 7A-7C, in accordance with the present invention.

Figure 7E is another view of the register assembly shown in Figure 7D, in accordance with the present invention.

Figure 7F depicts the media deskewing movement after contacting the first registration pin, in accordance with the present invention.

Figure 7G depicts the registration assembly positioned in the drum including a left edge registration pin, in accordance with the present invention.

Figure 7H is similar to Figure 7G, but with an edge detector substituted for the left edge registration pin.

Figure 7I depicts the final positioning of the first sheet of media in the cylindrical drum of the Figure 1 system, in accordance with the present invention.

Figure 7J depicts the securing of the first sheet of media to the mounting surface of the cylindrical drum of the Figure 1 system, in accordance with the present invention.

Figure 7K depicts the initiation of removal of the imaged first sheet of media from the cylindrical drum of the Figure 1 system, in accordance with the present invention.

Figure 7L depicts the buffering of the imaged first sheet of media removed from the cylindrical drum of the Figure 1 system, in accordance with the present invention.

Figure 7M depicts the buffering of two sheets of media as a third sheet of media is positioned in the cylindrical drum of the Figure 1 system, in accordance with the present invention.

Figure 8 depicts a punching/notching device, in accordance with the present invention.

## BEST MODE FOR PRACTICING THE INVENTION

**[0018]** Figure 1 depicts an imaging system 100 in accordance with the present invention. As shown, the imaging system 100 is comprised of a computer 110, a raster image processor (RIP) 120 and a platemaker or platesetter 130. The computer 110, which may be virtually any type of a computing device, allows images to be created or edited and serves as a general operator input device to the depicted imaging system. For example, the computer 110 can be utilized to select a particular scanning resolution and particular size media to be used during a particular operational sequence.

**[0019]** The platesetter 130 has three major components. An on-line stacked plate storage device or plate handler 142, an imaging engine or imagesetter 152, and an optional on-line plate processor/stacker 172.

**[0020]** The plate handler 142, which is controlled by a handler controller 140, stores media 144A-144D of various sizes, or stacks of various sizes, in respective cassettes 145A-145D. The plate handler 142 may also include a slip sheet removal mechanism 146 which is preferably of the type in U.S. Patent Application Serial No. 08/693,740 filed on 08/07/96, the disclosure of which is incorporated herein by reference. The slip sheet removal mechanism 146 is used to remove a slip sheet (not shown), if any, located between the individual sheets of media stored in the cassette. The slip sheet is placed between each sheet of media to protect the surface of the media from being scratched. As indicated, the cassettes 145A-145D are movable vertically to position a desired cassette below the media delivery device or plate picker 148, to provide plate picker 148 with access to media of the selected size. The plate picker 148 then conveys the individual sheets of media to a loading device or applicator 162 for loading onto the internal support surface 157 of a cylindrical drum 156.

**[0021]** The system operator can identify or select a desired plate size using the computer keyboard 114 or mouse 112, for example, to select one of multiple plate sizes displayed on a monitor of the computer 110 or to input a desired plate size or a cassette number representing the cassette in which plates of the desired size are stored. Selection of the plate size according to the image size may also be an automated feature of the computer 110, RIP 120, or imaging system 100. The identification or selection of the desired plate size on the computer 110 results in generation and transmission of a signal by the computer 110 to the RIP 120 which is transformed into an appropriate signal to the handler controller 140. In accordance with this signal, the controller 140 controls the handler 142 in the manner previously described such that the desired plate size plates can be accessed and conveyed by the plate picker 142 to the applicator 162 of the imaging engine 152.

**[0022]** The plate picker 148, removes a sheet of media from the applicable cassette, i.e., cassette 145B as shown, by lifting the media with rows of suction cups 149A-149C. The picker 148 then conveys the removed media, via a pair of rollers which form nips 180 and 182, to the applicator 162 of the imaging engine 152.

**[0023]** Images are transmitted from the computer 110

to the RIP 120 which converts the digitized signals received from the computer 110 into signals which can be understood by the engine controller 150 to control the imaging engine 152. The plate picker 148 which operates in conjunction with the plate handler 142 and the applicator 162 to convey individual sheets of media, i. e., individual plates as shown, from the plate handler 142 onto a support or mounting surface 157 of the cylindrical drum 156. Once properly positioned by the applicator 162 on the mounting surface 157, the media is scanning by a scanning light beam radiating from a moving scan assembly 154 in accordance with instructions from the engine controller 150 responsive to signals received from the RIP 120.

**[0024]** When the imager has recorded an image on the imaged sheet of media, the sheet of media is then transferred by the applicator 162 to the plate processor 172 via a second pair of rollers, which form nips 174 and 176. The plate processor 172 is controlled by the processor controller 170 in accordance with signals received from the RIP 120 to chemically, mechanically, or otherwise process the imaged media. The plate processor 172 is shown to be a chemical processor using silver based recording media, however the type of media processor will of course be determined by the type of media being imaged (e.g., thermal). The processed media is then removed from the system 100.

**[0025]** Figure 2 depicts the applicator 162 which is disposed within the drum 156. For orientation and reference purposes, the drum 156 defines three directions: an axial or longitudinal and circumferential direction, indicated by directional arrows 210 and 212 respectively, and a radial direction, defined by any line 215 which is perpendicular to the mounting surface 157. A rail or track 220 is provided on each end of the drum 156 to guide the applicator 162 movement along the circumferential direction 212 of the drum during positioning media on and removing media from the mounting surface 157 of the cylindrical drum 156. In the preferred embodiment of the present invention, the rail 220 is provided on the outside surface 232 on each end of the drum 156.

**[0026]** The applicator 162 comprises three main components. A self-propelling drive system 202 for propelling the applicator 162 along the tracks 220, a cup module for holding the media to the applicator (shown in Figs. 5A-5E), and a roller module (shown in Figs. 6A-6C) for ironing down the media to the mounting surface 157 to ensure the media is pressed firmly to the mounting surface. The applicator 162 includes a carriage 230 positioned along the axial direction 210 of the drum 156 and a pair of endplates 214 which supports the carriage.

**[0027]** Figs. 2 and 3 show the self-propelling drive system 202. A drive motor 200 is supported by endplate 214. The drive motor 200 rotates a longitudinal shaft 328 which is connected to a drive gear 310 at each end thereof. Each drive gear 310 is engaged with an idler gear 320 which is engaged with the track 220. Each endplate 214 is mounted to the track 220 by three bearings 322, 324, and 326. Bearings 322 and 324 have V-grooved outer races 325 which cooperate with a bearing rail 340 to accurately maintain the axial 210 and circumferential 212 position of the applicator with respect to the drum 156. Bearing 326 is located on the opposite side of track 220 and is spring-loaded in the radial direction 215 toward the center of the drum 156 to thereby hold and clamp each endplate 214 to track 220. A brake device (not shown) may be included in drive system 202 to hold the applicator 162 in position in the circumferential direction 212 of the drum 156, for example, if drive motor 200 loses power. Additionally, the brake device may be used to hold the applicator 162 in place for extended periods of time thereby reducing strain on drive motor 200.

**[0028]** Fig. 4 is a schematic illustration of the cup module, generally indicated by reference number 400. Suction cups 420A-420G are affixed to a support member or platen 430 which is slidably mounted to endplates 214 so that the suction cups may travel in the radial direction 215 of the drum 156. Each suction cup is connected via flexible hoses 418 to a manifold box 410, which in the preferred embodiment of the invention is located in the imaging engine 152 but not on the applicator itself 162. The manifold box 410 houses sequencing devices or servos 416 which are connected via hoses 414 to a device for drawing air 412, e.g., a vacuum pump, which may be located in the manifold box, and to an individual suction cup 420A-420G. The device for drawing air 412 and servos 416 are controlled by engine controller 150. In operation, the engine controller receives the media information required for the job and directs the appropriate number of servos 416 to either block or allow air flow through each suction cup 420A-420G depending on the media size selected. For the widest media to be held by suction cups 420A-420G and hence the applicator 162, which substantially covers the mounting surface 157 of the cylindrical drum 156 in the axial direction 210, all the servos 416 would be open allowing air to be drawn through each suction cup. Thus, only the suction cups 420A-420G which will contact the surface of the media are selected to have air drawn through.

**[0029]** Figure 5A illustrates the cup module's 400 drive system. A drive motor 240, fixedly mounted to the applicator carriage 230 and interfacing with engine controller 150, turns drive gear 542 which is engaged with a cam-shaped idler gear 544, as particularly featured in Figure 5B. Idler gear 544 is fixedly mounted to shaft 510 which is rotatably mounted to endplate 214 on each end thereof. In this manner, drive motor 240 causes shaft 510 to rotate. A U-shaped bracket 560, fixedly attached to shaft 510 and extending therefrom, cooperates with an L-shaped bracket 570 fixedly attached to platen 430, as particularly illustrated in Figure 5C, to raise and lower the platen. Platen 430 is slidably mounted to endplates 214 at each end allowing movement in the radial direction 215 of the drum 156. In operation, as bracket 560 rotates, the L-shaped bracket slides in and out of brack-

et 560 causing platen 430, which supports suction cups 420A-420G, to move in the radial direction 215 of the drum 156. In the preferred embodiment of the present invention, shaft 510 and longitudinal shaft 328 of the self-propelling drive system 202 are co-axial, i.e., longitudinal shaft 328 is mounted within shaft 510, thereby saving space in the applicator 162.

**[0030]** Figure 5D further depicts the suction cup module 400. Because the suction cups (e.g., 420A-420G) will be contacting a plate to be loaded into the drum 156 directly, it is preferable that each suction cup be formed from a non-marking, pliant material such as urethane. It is also advantageous to include extensions or finger members 582 on each suction cup, the finger members being positioned along the longitudinal axis of the applicator 162. Finger members 582 prevent the media from rippling as it is pressed against the mounting surface 157 of the drum 156 during the loading operation, as will be further discussed below. Additionally, less suction cups 420A-420G are needed if finger members 582 are present because they spread out the applied force of the suction cups to the media during the loading operation, which reduces the likelihood of rippling the media.

**[0031]** Figure 5E shows an exploded isometric view of an exemplary suction cup assembly 580, e.g., suction cup 420A. Generally, each suction cup is slidably mounted on platen 430 so as to be movable in the circumferential direction 212 of the drum 156. This allows a sheet of media held by the cups to be deskewed or squared on the mounting surface 157 of the drum 156, as will be discussed in detail below. More particularly, suction cup 420A connects to fitting 419 which is connected to hose 418. A block 588 and a plate having extending portions forming finger members 582 are disposed in-between the fitting 419 and suction cup 420A. Block 588 includes grooves 589 for slidably receiving a U-shaped bracket 583 which is fixedly attached to platen 430. Springs 586 are attached to block 588 on one end and to platen 430 on the other end thereby resiliently biasing suction cup 420A in the circumferential direction 212. It is preferable to bias all the suction cups 420A-420G towards the edge of the drum 156 where the sheet of media held by the cups will be positioned during imaging as further detailed below.

**[0032]** Figures 6A-6C detail the roller module 600. A drive motor 250, fixedly mounted to the applicator carriage 230, rotates drive gear 610 which is engaged with idler gear 620. Idler gear 620 is fixedly attached to shaft 630 which is rotatably mounted to endplate 214 on each end thereof. In this manner, drive motor 250 causes shaft 630 to rotate. A U-shaped bracket 632, fixedly attached to shaft 630 and extending therefrom, cooperates with a pin 634 fixedly attached to a platen 650, as particularly illustrated in Fig. 6B. A support member or platen 650 is slidably mounted to the applicator carriage 230 by means of slide assemblies 640. As particularly featured in Fig. 6C, slide assemblies 640 include a U-shaped angled bracket 641 which is fixedly attached to the applicator carriage 230. Grooves 644 in the wall of bracket 641 allow a block 642, which is fixedly mounted to platen 650, to slide in grooves 640. Thus, platen 650 may move in the radial direction 215 of the drum 156. Platen 650 supports individually spring-loaded rollers 660A-660D which press or iron down the media onto the mounting surface 157 as will be described below.

**[0033]** Fig. 7A depicts the initial delivery of a single sheet of media 144B1, e.g., an aluminum or polyester plate, by the plate picker 148 to the applicator 162. Figure 7A also provides further detail of the plate picker 148. As shown, the plate picker 148 includes suction cups 149A-149C. The vacuum created by the operation of the suction cups 149A-149C is distributed onto a major portion of the top surface of the plate 144B1 to lift the plate from the plate handler cassette 145B and to hold the plate as it is moved from the plate handler 142 to the applicator 162. As shown, rollers or wheels 702A-702C are provided for moving the plate picker 148 between the plate handler 142 and the far side of the cylindrical drum 156. The rollers 702A-702C ride along tracks or rails (not shown) which guide its movement between the plate handler 142 and drum 156.

**[0034]** As noted above, the plate picker 148 lifts and conveys the plate 144B1 by contacting only the top side of the plate. Because the plates are stored in each cassette 145A-145D emulsion side down, the emulsion side of the plate 144B 1' is not contacted by the suction sups 149A-149C of the plate picker 148. As shown, the plate picker 148 moves the plate 144B I over the mounting surface 157 of the cylindrical drum 156 at a distance above the cylindrical drum 156. As will be described further below, this facilitates the buffering of a plate proximate to the applicator 162 when the applicator is moved to the upper right side of the cylindrical drum 156, i.e., its parked or home position. As will be described in more detail below, this permits the plate picker 148 to return to the plate handler 142 to retrieve another plate while there is a plate being imaged in the imager 152 and a plate in the buffering position.

**[0035]** As the plate picker 148 moves towards the applicator 162, the vacuum created by suction cups 149A-149C is extinguished so that the leading edge of the plate 144B1 separates from the suction cups. A guide block 704 guides the leading edge of the plate 144B1 to a pair of drive rollers which form nip 180. Nip 180 rotates to drive and guide the leading edge of the plate 144B1 between a pair of drive wheels forming nip 182, which is controlled by the engine controller 150. An input sensing device 706 which preferably includes a light emitting diode (LED) for directing light, of a wavelength which does not expose the plate, onto the plate 144B1 and a light detector, for example a photodiode, for sensing light reflected by the plate 144B1, detects the passage of the leading edge of the plate 144B1. More particularly, when the leading edge of the plate reflects the light emitted by the LED, the detector senses the reflected light causing it to generate an electrical signal to the engine

controller 150, thereby informing the engine controller of the disposition of the plate 144B1. As shown in Figure 7A, the engine controller 150 controls the nip 182 to drive the leading edge of the plate 144B1 to a predetermined position beyond the sensing device 706 so as to be accessible by the applicator 162. The rollers 660A-660D on the applicator 162 may be used to guide the plate so the leading edge of the media 144B1 does not interfere with suction cups 420A-420G as the plate is positioned beyond the sensing device 706.

**[0036]** The suction cups 420A-420G are initially fully retracted in the home position, i.e., the suction cups are extended radially inward, as shown in Fig. 7A. When the leading edge of the media 144B1 is finally positioned by nips 180 and 182, the engine controller 152 causes suction cups 420A-420G to begin drawing air by controlling servos 416 as described above, the number of suction cups activated corresponds to the width of the plate 144B1 in the axial direction 210 of the drum 156. The engine 150 controller also simultaneously causes drive motor 240 to extend suction cups 420A-420G radially outward to attach the suction cups of the applicator to the emulsion side of the plate. In the preferred embodiment of the present invention, the suction cups 420A-420G are positioned approximately 1/2" from the leading edge of the plate 144B1. Once the suction cups 420A-420G have taken hold of the plate, the engine controller 150 then directs drive motor 240 to move suction cups 420A-420G thereby lifting the plate 144B1 away from the mounting surface 157 so as to be positioned to move the plate clockwise in the drum 156. In the preferred embodiment, the leading edge 144B1' is lifted approximately one inch (measured radially) off the mounting surface 157 which allows sufficient clearance during the loading operation described below.

**[0037]** Figure 7B depicts the plate 144B1 being loaded by the applicator 162, leading edge 902 and trailing edge 904 last, onto the mounting surface 157 of the cylindrical drum 156 emulsion side 144B1' facing radially inward. Another plate 144B2 has been moved, during the loading of plate 144B1, by the plate picker 148 and nips 180 and 182 to be held over the mounting surface. 157 while plate 144B1 is imaged, i.e., held in a 'buffer' position. The leading edge of plate 144B2 is disposed at the previously described distance past input sensing device 706. The plate 144B2 is, as shown, entirely released from the plate picker 148 during buffering. Accordingly, the plate picker 148 may be directed by engine controller 150 to return to a position over the cassette 145B to begin delivery of yet another plate to the applicator 162 after the release of the plate 144B2.

**[0038]** In Figure 7C, the applicator 162 has loaded the plate 144B1 onto the mounting surface 157 of the cylindrical drum 156 and is approaching register assembly 708 but has yet to complete the final positioning of the plate. As indicated, the emulsion side 144B1' of plate 144B1 is positioned facing radially inward within the cylindrical drum 156. The engine controller 150 directs drive motor 240 to extend suction cups 420A-420G radially outward to lower the leading edge 902 of plate 144B1 towards mounting surface 157 as the plate approaches a register assembly 708. In the preferred embodiment of the present invention, ironing rollers 660A-660D may be extended radially outward to bend the plate 144B1 so that it conforms with the.curvature of the mounting surface 157 of the cylindrical drum 156. This allows the leading edge 902 of plate 144B1 to be lifted slightly away from mounting surface 157 so that the leading edge first contacts the register assembly 708. This operation is preferred because the plate 144B1 may be rigid and thus not conform to the curvature of the drum 156, making it difficult to properly register-and position the plate 144B1 to the mounting surface 157.

**[0039]** A register assembly 708 is preferably of the type described in U.S. Patent Application Serial No. 08/868,720, filed on June 4, 1997, (Attorney Docket #3175-017), the disclosure of which is incorporated herein by reference, is located at the upper left side of the cylindrical drum 156 and is used to finally positioned the leading edge 902 of plate 144B1 as it is loaded by applicator 162 onto the mounting surface 157. In the preferred embodiment of the present invention, there are two register pin and bar assemblies 708 slidably mounted along the axial direction 210 of the drum 156, such that media of differing widths can be properly registered as will be described below. A drive device (not shown) connected to engine controller 150 and positioned on each register pin and bar assembly 708, drives each assembly along the axial direction 210 according to a signal generated by the engine controller which corresponds to the width of the media in the axial direction 210.

**[0040]** Figures 7D and 7E depict the register assembly 708 used to ensure proper alignment of the plate 144B 1 on the mounting surface 157. A registration pin 719 includes a registration pin member 710 and slide member 711. The slide members 711 are mounted to springs 716 which are designed to allow movement of the pin member 711 towards and away from a contact surface 721 of a registration bar 718. Registration bar 718 is positioned at the upper left side of the cylindrical drum 156 and extends along the axial direction 210 of the drum 156. The slide members 711 pass through an elongated aperture formed along substantially the full length of registration bar 718 and are supported by bushings 714 disposed therein.

**[0041]** A light emitting diode (LED) 712 is provided to emit a radiating light beam which passes between the registration pin member 710 and the registration bar 718 when not in contact. The light detected by the photodiode 722 which generates a signal to the engine controller 150 indicative of no contact between the registration pin 719 and registration bar 718. This allows engine controller 150, and accordingly the system operator, to determine if plate 144B 1 is properly positioned on mounting surface 157 of the cylindrical drum 156 prior to im-

aging. Alternatively, a registration device could be provided which includes an electric detection circuit which is closed when a metallic media contacts the device. However, such circuits can only confirm whether or not the media is properly positioned when the media is metallic and are useless when a non-metallic media is being positioned on the mounting surface 157.

**[0042]** As shown in Figure 7E, the LED 712 and photodiode 722 are disposed between the slide pins 711. As plate 144B1 moves in the direction of the arrow 760, the leading edge 902 of plate 144B1 makes contact with pin member 710 and pushes the pin 719 such that the slide members 711 force the springs 716 to be compressed and the contact surface 720 of the registration pin 710 to move toward the contact surface 721 of the registration bar 718. When the contact surfaces 720 and 721 make contact, the light from the LED 712 is totally blocked such that the photodiode 722 ceased to detect the radiating light. The photodiode 722 therefore stops generating a signal to the engine controller 150 thereby indicating to the engine controller, and hence to the system operator, that media 144B1 is in proper registration at the applicable registration pin 719.

**[0043]** Figure 7F shows the movement of plate 144B1 1 after contact between the first registration pin 719 positioned proximate to the right side of the plate 144B1 with the registration bar 718, while a second registration pin 719 proximate to the left side of plate 144B1 has yet to contact the registration bar 718, with the plate 144B1 being moved in the direction indicated by arrow 760. Accordingly, plate 144B1 1 is improperly positioned on the mounting surface 157 at this point.

**[0044]** As indicated previously, suction cups 420A-420G are attached proximate the leading edge 902 of plate 144B1. Suction cups 420A-420G are spring biased towards the registration bar 718. Because the engine controller 150 is aware that the left registration pin 719 has yet to contact the registration bar 718, engine controller directs drive motor 240 of the applicator 162 to move plate 144B1 toward the registration bar 718. The plate 144B1, although restricted from further movement toward the registration bar 718 on the right side of the plate 144B1, is able to slightly rotate about the right side registration pin 719. Suction cups 420A-420G move relative to the applicator 162 allowing this slight rotation. This allows the left side of plate 144B1 1 to continue to move, pushing the left side registration pin 719 up against the registration bar 718 and thereby eliminate the skew as indicated. The final position of the suction cups is indicated by dashed circles 420A'-420f' and final position of the deskewed plate is indicated by 906.

**[0045]** In the preferred embodiment of the present invention, the plate 144B1 is left justified using an edge detector assembly 794, as shown in Fig. 7H. Alternatively, as shown in Fig. 7G, a registration pin 793 may be used to guide the edge of the plate as the leading edge 902 contacts the registration pins 719 so that the plate is consistently left edge justified on the drum 152. As shown in Figure 7H, the left edge detector 794 is a large area light detector which is recessed in the drum 152. The detector 794 detects light from a scanning light beam used to image the media. A signal representing the location of the edge of the plate is provided by scanning the detector 794 until the scanning beam reaches the edge of the plate. The signal is transmitted to the engine controller 150 which, on the basis of the identified location of the side edge of the plate, begins recording an image a predefined distance from the edge of the plate. It is important to position the image on the plate with respect to the register assembly 708 and the left edge and to use these same registration points in post-imaging operations, for example, to register the plate in a punching or notching device as will be described in more detail below.

**[0046]** At this point, as discussed above, the engine controller 150 is made aware when both registration pins 719 are registered to the registration bar 718 and, accordingly, that plate 144B1 is ready for final positioning on the mounting surface 157 of the cylindrical drum 156. The engine controller 150 directs drive motor 240 to extend suction cups 420A-420G radially outward so the suction cups and finger members 582 push plate 144B1 against the mounting surface 157. The finger members 582 ensure the plate 144B1 uniformly contacts the mounting surface 157, as described above.

**[0047]** Figure 7I depicts the final positioning of the plate 144B1 against the register assembly 708. The drum 156 contains a vacuum system for holding plates to the mounting surface 157, preferably as described in U.S. Patent Application Serial Nos. 08/867,128, now published as US 604,7733, and 08/868,526, now published as US 6133936, both filed on June 4, 1997. Briefly, as shown in Fig. 7J, the drum is provided with a device for drawing air (not shown) connected to sequencing manifolding devices 732 which communicate with vacuum channels 736 disposed with the drum 156. Vacuum channels 736 communicate with chambers 736 disposed underneath the mounting surface 157 parallel to the registration bar 718. A plurality of vacuum ports 738 pass from the mounting surface 157 and communicate with chambers 736. The device for drawing air and manifolds 732 are controlled by the engine controller 150 so that air drawn by the device for drawing air can be controlled by manifolds 732 to draw air only through those vacuum ports 738 in the mounting surface 157 covered by plate 144B1. The device for drawing air is provided with more than one setting for increasing or decreasing the volume of air being drawn depending on the type of media to be held to the mounting surface 157. For example, polyester media is more pliable than an aluminum media so the device for drawing air is made to be controllable to reduce the volume of air being drawn so the media is not drawn into grooves patterns (not shown) disposed within the mounting surface which communicate with the vacuum ports 738.

**[0048]** In the preferred embodiment of the present in-

vention, after plate 144B1 is properly positioned on the mounting surface 157, the engine controller 150 directs vacuum to be drawn from a first row of chambers 738 disposed directly below the leading edge 902 thereby holding the leading edge 902 of plate 144B1. Vacuum to suction cups 420A-420G of the applicator 162 is extinguished and the suction cups are directed by engine controller 150 to travel radially inward so they are not contacting plate 144B1. The engine controller 150 simultaneously directs drive motor 250 to extend ironing rollers 660A-660D radially outward such that the rollers press plate 144B1 to the mounting surface 157. The engine controller 150 then directs drive motor 200 to move applicator in a counter-clockwise fashion such that ironing rollers 660A-660D press or iron plate 144B1 to the mounting surface 157. As ironing rollers 660A-660D pass over each row of chambers 736, the engine controller 150 controls manifolds 732 such that air is drawn through each row of chambers 738 the rollers pass over as well as any row of chambers the rollers have already passed over. Alternatively, the vacuum system could be controlled by the engine controller 150 so that a volume of air is first drawn over the entire region of the mounting surface 157 the plate 144B1 will cover and then the ironing rollers 660A-660D could begin ironing down plate 144B1.

**[0049]** After the applicator 162 has finished ironing down plate 144B1, it returns to the home position, as shown in Figure 7A. The engine controller 150 then processes a signal to indicate that the positioning is complete and directs the scan assembly 154 to record an image onto the plate 144B1.

**[0050]** Upon completion of the image recording process, the applicator 162 begins the removal of plate 144B1 from the mounting surface 157, as shown in Fig. 7K. It should be noted that edge 902, which was the leading edge of the plate 144B 1 as it was being positioned on the mounting surface 157 as shown in Fig. 7B, is the trailing edge of the plate 144B1 as it is removed by the applicator 162 from the mounting surface 157. Similarly, edge 904, which was the trailing edge of the plate 144B1 as it was being loaded onto the mounting surface 157, is now the leading edge of plate 144B1 as it is removed from the mounting surface of the drum 156. The engine controller 150 directs drive motor 200 to position the applicator 162 such that suction cups 420A-420G are positioned near edge 904, which in the preferred embodiment, is between 2-1/2"-3" from edge 904. Vacuum is drawn through suction cups 420A-420G as they extend radially outward to attach to plate 144B1. Simultaneously, or just prior to drawing air through suction cups 420A-420G, the vacuum system which holds plate 144B1 to the mounting surface is extinguished so the plate may be lifted off the mounting surface 157. Suction cups 420A-420G, now attached to plate 144B1, retract and the applicator 162 travels counter-clockwise on track 220 towards the home position. It is preferable to allow the vacuum system which holds the plate 144B1 to the mounting surface 157 sufficient time to extinguish (i.e., 'bleed off) the vacuum so that plate 144B1 can be lifted off as soon as cups 420A-420G contact plate 144B1.

**[0051]** An output sensing device 780, shown in Figure 7L, which preferably includes a light emitting diode (LED) for directing light onto the imaged plate 144B1 and a light detector, for example a photodiode, for sensing light reflected by plate 144B1, detects the passage of the leading edge 902 of the plate. More particularly, when the leading edge 902 of the plate 144B1 reflects the light emitted by the LED, the detector senses the reflected light causing it to generate an electrical signal to the engine controller 150, thereby informing the engine controller of the disposition of the plate 144B1. The engine controller 150 then directs the applicator 162 to move a predetermined distance counter-clockwise on track 220 such that the leading edge 902 is delivered and secured within a pair of drive rollers forming nip 174. Vacuum is extinguished in suction cups 420A-420G and the suction cups are retracted such that they move radially inward. Nip 174, controlled by the engine controller 150, drive the plate 144B1 to nip 176, and hence to a buffered position prior to entering a plate processor 172. The plate 144B1 is buffered until the plate processor 172 is ready to process the plate, at which time nips 174,176, and 177 drive the plate into the plate processor 172 for processing.

**[0052]** Figure 7M depicts plate 144B1 in a buffered position awaiting loading in the plate processor 172. Simultaneously, the plate 144B2 is positioned on the mounting surface 157 of the cylindrical drum 156 by the applicator 162, leading edge 910 first and trailing edge last 912. At the same time, a third plate 144B3, which has an emulsion side 144B3', is buffered above the mounting surface 157 of the cylindrical drum 156. The plate picker 148 may be directed by the engine controller 150 to return to a position over the cassette 145B to begin delivery of yet another plate to the applicator 162 after the release of plate 144B3. Accordingly, the imaging system 100 has two plates buffered and one plate being positioned in the cylindrical drum 156 for imaging.

**[0053]** After being processed by the plate processor 172, plate 144B1 may be removed and placed on a punching/notching device, referred to as reference number 800 in Figure 8. The punching/notching device 800 comprises a support surface 801 which may hold moveable registration pins 820 and justification pin 830. Recessed within the support surface 801 are dies 804 for receiving punches 802, which are affixed to pivotal member 806. Registration pins 820 are positioned at a predetermined distance apart according to the plate size with larger plates having larger pin separations to provide more accurate alignment of the plate leading edge 144B1 with punches 802. In operation, the operator sets the pins 820 according to the plate size and then places plate 144B1 on the support surface 801 and registers the leading edge 902 to registration pins 820 and justi-

fication edge 822 to justification pin 830. A handle 808 is provided on the pivotal member 806 for rotating the pivotal member such that punches 802 pass through the plate 144B1 and engage dies 804. It is important to configure the moveable registration pins 719 and justification pin 793 in the imaging engine 152 as closely as possible to the configuration on the punching/notching device 800 so the plate 144B1 is being registered by the same points on the leading 902 and justification edge 822 of the plate. The configurations should be the same because the image is positioned on the printing plate 144B1 at a known distance and orientation relative to the leading 902 and justification edge 822 of the plate. Therefore, in order to ensure the plate 144B1 and hence the image is positioned at a known distance and orientation relative to a reference surface in a printing press (not shown), it is preferable to use the same registration points on the leading 144B1 and justification edge 822 to eliminate errors due to local imperfections or defects in the plate edge. This is especially important in color printing applications, for example, where four or more color separations of the image must be consistently registered to the printing press. The present invention thus reduces registration errors in color printing with an automated platemaking system.

## Claims

1. An imaging system (100), comprising:

   - a sheet of media (144B1) to be imaged at an imaging position, said sheet of media including a leading edge (902);
   - a support surface (157) for supporting said sheet of media at said imaging position during imaging;
   - a registration device (708) including a registration axis configured to be contacted by said leading edge for indicating when said sheet of media is at said imaging position;
   - a loading device (162) for advancing said sheet of media across said support surface with said leading edge substantially perpendicular to a direction of movement of said advancing sheet of media until said leading edge is registered against said registration device;
   - an imaging device (154) configured to expose an image onto said sheet of media, said image being positioned at a predetermined distance and orientation relative to said registration axis;
   - wherein said loading device includes a plurality of attaching devices (420A-420G) being mounted on a support member (430) of said loading device for attaching said sheet of media near said leading edge,

   **characterized in that**

   said attaching devices(420A-420G)are configured to be moveable relative to said support member (430)and relative to each other in said direction of movement of said sheet of media (144 B1)for aligning said leading edge(902) with said registration axis.

2. The imaging system according to claim 1, wherein said attaching devices (420A-420G) are configured to be slidably moveable in said direction of movement of said sheet of media(144B1).

3. The imaging system according to one of the claims 1 or 2, wherein said loading device(162)lifts said leading edge (902)above said support surface(157) while advancing said leading edge(902)across said support surface(157)and lowers said leading edge (902)towards said support surface(157)as said leading edge approaches said registration device (708).

4. The imaging system according to one of the above claims, wherein said imaging device(154)is configured to scan said sheet of media(144B1) with an exposing beam to linewise expose said image onto said sheet of media.

5. The imaging system according to one of the above claims, wherein said registration device(708)further comprises a registration bar (718) having a reference surface (721) for defining said registration axis, said reference axis being positioned with respect to said support surface(157) and said imaging device(154) and being configured to be contacted by said leading edge(902) for indicating when said sheet of media is at said imaging position.

6. The imaging system according to one of the above claims, wherein said loading device(162)aligns said leading edge(902)substantially parallel with said registration axis.

7. The imaging system according to one of the above claims, wherein said registration device(708)further comprises a first and a second moveable registration element (719) configured to be contacted and moved by said leading edge(902)and constrained by said reference surface.

8. The imaging system according to claim 7, wherein at least one of said first and said second moveable registration elements(719) is moveable along an axis parallel to said registration axis for changing the separation between said first and said second moveable registration elements(719)in accordance with the size of said sheet of media(144 B1).

9. The imaging system according to one of the above

claims, wherein said registration device(708) further comprises a first and a second registration point (719) for defining said registration axis, said first and said second points being configured to be contacted by said leading edge(902) when said sheet of media is at said imaging position.

10. The imaging system according to claim 9, wherein at least one of said first and said second registration points(719) is moveable along an axis parallel to said registration axis for changing the separation between said first and second registration points (719) in accordance with the size of said sheet of media.

11. The imaging system according to one of the above claims, wherein said plurality of attaching devices (420A-420G) communicate with a sequencing device (410) for drawing air through a predetermined number of said plurality of attaching devices(420A-420G), said predetermined number corresponding to the width of said sheet of media such that only said plurality of attaching devices contacting said sheet of media are activated.

12. The imaging system according to one of the above claims, wherein said loading device further comprises an ironing roller (660A-660D) for rolling against said sheet of media after said loading device(162) has positioned said sheet of media at said imaging position thereby providing contact between said sheet of media and said support surface(157).

13. The imaging system according to one of the above claims, further comprising a holding mechanism for holding said sheet of media onto said support surface(157), comprising:

- a plurality of vacuum ports (738) passing through and disposed in a predefined pattern over said support surface;
- a device for drawing air through each of said plurality of vacuum ports to hold said sheet of media against said support surface; and
- a sequencing manifold (732) connected between said device for drawing air and said plurality of vacuum ports for selectively drawing air through a portion of said plurality of vacuum ports in accordance with the size of said sheet of media.

14. The imaging system according to claim 13, wherein said plurality of vacuum ports(738) are disposed in a plurality of rows, each row being substantially parallel with said registration axis, and further comprising a controller (150) for controlling said sequencing manifold(732)such that air is cumulatively and sequentially drawn through each row of said plurality of rows of said vacuum ports as said roller device passes over each of said plurality of rows.

15. The imaging system according to one of the above claims, wherein said sheet of media further includes a justification edge substantially perpendicular to said leading edge, said imaging system further comprising:

- another registration device configured to be contacted by said justification edge for indicating when said sheet of media is at said imaging position; and
- wherein said imaging device(154) is configured to expose said image onto said sheet of media at a predetermined distance from said justification edge.

16. The imaging system according to one of the above claims, wherein said sheet of media includes a justification edge substantially perpendicular to said leading edge, said imaging system further comprising:

- a device (794) for determining a position of said justification edge; and
- wherein said imaging device(154) is configured to expose said image onto said sheet of media at a predetermined distance and orientation relative to said position of said justification edge.

17. A method of imaging, comprising:

(a) attaching a sheet of media near its leading edge to attaching devices (420A-420G) included in a loading device(162) and mounted on a support member (430) of said loading device;

(b) advancing said sheet of media (144B1) with said loading device(162) across a support surface(157) to an imaging position, a leading edge(902) of said sheet of mediaF(144B1) advancing substantially perpendicular to a direction of movement of said sheet of media;

(c) driving said leading edge(902)against a registration device(708)having a registration axis until said sheet of media is in contact with said registration device(708), wherein said attaching devices(420A-420G) are moveable relative to said support member(430)and relative to each other in said direction of movement of said sheet of media for aligning said leading edge with said registration axis; and

(d) exposing an image onto said sheet of media with an imaging device (154) configured to expose an image onto said sheet of media, said

image being positioned at a predetermined distance and orientation relative to said registration axis.

18. The method of imaging according to claim 17, further including the steps of:

(a) lifting said leading edge(902)away from said support surface(157) while advancing said leading edge across said support surface; and

(b) lowering said leading edge(902) towards said support surface(157) prior to driving said leading edge against said registration device (708).

19. The method of imaging according to one of the claims 17 or 18, further comprising the step of continuing to drive said leading edge(902) against said registration device(708) with said loading device until said leading edge is substantially parallel with said registration axis.

20. The method of imaging according to one of the claims 17 to 19, wherein said registration device (708) includes a first and a second registration movable point (719) for defining said registration axis, further comprising the steps of:

(a) selecting a sheet of media (144B1) according to the size of the image to be recorded prior to advancing said sheet of media; and
(b) moving at least one of said first and said second moveable registration points(719) along an axis parallel to said registration axis thereby changing the separation between said first and second registration points in accordance with the size of said sheet of media.

21. The method of imaging according to one of the claims 17 to 20, further comprising the step of forcing said leading edge(902) against said support surface(157) after said loading device(162) has positioned said sheet of media at said imaging position thereby providing contact between said sheet of media and said support surface(157).

22. The method according to one of the claims 17 to 21, wherein said loading device further comprises an ironing roller (660A-660D) and said support surface includes a plurality of vacuum ports (738) passing through said support surface and disposed in rows parallel to said registration axis, a device for drawing air through each of said plurality of vacuum ports to hold said sheet of media against said support surface, and a sequencing manifold (732) connected between said device for drawing air and said plurality of vacuum ports for selectively drawing air through a portion of said plurality of vacuum ports, further comprising the steps of:

(a) drawing air through a row of said plurality of rows of said vacuum ports(738) adjacent said leading edge(902) after said leading edge has been pressed to said support surface(157);

(b) rolling said sheet of media with said ironing roller (660A-660B)thereby providing contact between said sheet of media and said support surface(157); and

(c) controlling (150) said sequencing manifold to cumulatively and sequentially draw air through each row of said plurality of vacuum ports(660A-660B) as said roller devices passes over each of said plurality of rows.

23. The method of imaging according to one of the claims 17 to 22, wherein said sheet of media includes a justification edge substantially perpendicular to said leading edge (902), further comprising the step of registering said justification edge(794) to another registration device (793).

24. The method of imaging according to claim 23, further comprising the step of exposing said image onto said sheet of media at a predetermined distance from said another registration device.

25. The method of imaging according to one of the claims 17 to 24, wherein said sheet of media includes a justification edge substantially perpendicular to said leading edge, further comprising the steps:

(a) determining a position of said justification edge (794); and
(b) exposing said image onto said sheet of media at a predetermined distance from said position of said justification edge(794).

**Patentansprüche**

1. Belichtungssystem (100), umfassend:

- ein Medienblatt (144B1), das in einer Belichtungsposition belichtet werden soll, wobei das Medienblatt einen vorderen Rand (902) enthält;

- eine Auflagefläche (157) zum Aufnehmen des Medienblattes in der Belichtungsposition beim Belichten;

- eine Vorrichtung für lagegenaue Ausrichtung (708), die eine Ausrichtungsachse enthält, die

so konfiguriert ist, dass sie mit dem vorderen Rand in Kontakt kommt, um anzuzeigen, wann das Medienblatt in der Belichtungsposition ist;

- eine Ladevorrichtung (162) zum Vorwärtsbewegen des Medienblattes über die Auflagefläche, wobei der vordere Rand im Wesentlichen senkrecht zu einer Bewegungsrichtung des sich vorwärts bewegenden Medienblattes ist, bis der vordere Rand an der Vorrichtung für lagegenaue Ausrichtung lagegenau ausgerichtet ist;

- eine Belichtungsvorrichtung (154), die so konfiguriert ist, dass sie das Medienblatt mit einem Bild belichtet, wobei das Bild in einer vorbestimmten Entfernung und Ausrichtung im Verhältnis zu der Ausrichtungsachse positioniert ist;

- wobei die Ladevorrichtung eine Vielzahl von Befestigungsvorrichtungen (420A bis 420G) enthält, die an einem Tragelement (430) der Ladevorrichtung zum Befestigen des Medienblattes nahe dem vorderen Rand angebracht sind,

**dadurch gekennzeichnet, dass**

die Befestigungsvorrichtungen (420A bis 420G) so konfiguriert sind, dass sie im Verhältnis zu dem Tragelement (430) und im Verhältnis zueinander in der Bewegungsrichtung des Medienblattes (144B1) zum Ausrichten des vorderen Randes (902) an der Ausrichtungsachse beweglich sind.

2. Belichtungssystem nach Anspruch 1, wobei die Befestigungsvorrichtungen (420A bis 420B) so konfiguriert sind, dass sie in der Bewegungsrichtung des Medienblattes (144B1) verschiebbar beweglich sind.

3. Belichtungssystem nach einem der Ansprüche 1 oder 2, wobei die Ladevorrichtung (162) den vorderen Rand (902) von der Auflagefläche (157) hochhebt, während sie den vorderen Rand (902) über die Auflagefläche (157) vorwärts bewegt, und den vorderen Rand (902) in Richtung der Auflagefläche (157) absenkt, wenn sich der vordere Rand der Vorrichtung für lagegenaue Ausrichtung (708) nähert.

4. Belichtungssystem nach einem der vorhergehenden Ansprüche, wobei die Belichtungsvorrichtung (154) so konfiguriert ist, dass sie das Medienblatt (144B1) mit einem Belichtungsstrahl abtastet, um das Medienblatt zeilenweise mit dem Bild zu belichten.

5. Belichtungssystem nach einem der vorhergehenden Ansprüche, wobei die Vorrichtung für lagegenaue Ausrichtung (708) ferner eine Ausrichtungsstange (718) umfasst, die eine Referenzfläche (721) zum Definieren der Ausrichtungsachse aufweist, wobei die Referenzachse im Verhältnis zu der Auflagefläche (157) und der Belichtungsvorrichtung (154) positioniert und so konfiguriert ist, damit sie mit dem vorderen Rand (902) in Kontakt kommt, um anzuzeigen, wann das Medienblatt in der Belichtungsposition ist.

6. Belichtungssystem nach einem der vorhergehenden Ansprüche, wobei die Ladevorrichtung (162) den vorderen Rand (902) im Wesentlichen parallel zu der Ausrichtungsachse ausrichtet.

7. Belichtungssystem nach einem der vorhergehenden Ansprüche, wobei die Vorrichtung für lagegenaue Ausrichtung (708) ferner ein erstes und ein zweites bewegliches Ausrichtungselement (719) umfasst, die so konfiguriert sind, dass sie mit dem vorderen Rand (902) in Kontakt kommen und durch ihn bewegt werden und durch die Referenzfläche eingespannt werden.

8. Belichtungssystem nach Anspruch 7, wobei mindestens das erste oder das zweite bewegliche Ausrichtungselement (719) zum Verändern des Abstandes zwischen dem ersten und dem zweiten beweglichen Ausrichtungselement (719) entsprechend der Größe des Medienblattes (144B1) entlang einer parallel zu der Ausrichtungsachse verlaufenden Achse beweglich ist.

9. Belichtungssystem nach einem der vorhergehenden Ansprüche, wobei die Vorrichtung für lagegenaue Ausrichtung (708) ferner einen ersten und einen zweiten Ausrichtungspunkt (719) zum Definieren der Ausrichtungsachse enthält, wobei der erste und der zweite Punkt so konfiguriert sind, dass sie mit dem vorderen Rand (902) in Kontakt kommen, wenn das Medienblatt in der Belichtungsposition ist.

10. Belichtungssystem nach Anspruch 9, wobei mindestens der erste oder der zweite Ausrichtungspunkt (719) zum Verändern des Abstandes zwischen dem ersten und zweiten Ausrichtungspunkt (719) entsprechend der Größe des Medienblattes entlang einer parallel zu der Ausrichtungsachse verlaufenden Achse beweglich ist.

11. Belichtungssystem nach einem der vorhergehenden Ansprüche, wobei die Vielzahl von Befestigungsvorrichtungen (420A bis 420G) mit einer Abfolgevorrichtung (410) zum Ansaugen von Luft durch eine vorbestimmte Anzahl der Vielzahl von Befestigungsvorrichtungen (420A bis 420G) kom-

muniziert, wobei die vorbestimmte Anzahl der Breite des Medienblattes entspricht, so dass nur die Vielzahl von Befestigungsvorrichtungen, die mit dem Medienblatt in Kontakt kommt, aktiviert wird.

12. Belichtungssystem nach einem der vorhergehenden Ansprüche, wobei die Ladevorrichtung ferner eine Anpressrolle (660A bis 660D), die über das Medienblatt rollt, nachdem die Ladevorrichtung (162) das Medienblatt in der Belichtungsposition positioniert hat, wodurch Kontakt zwischen dem Medienblatt und der Auflagefläche (157) hergestellt wird.

13. Belichtungssystem nach einem der vorhergehenden Ansprüche, das ferner einen Haltemechanismus zum Halten des Medienblattes auf der Auflagefläche (157) umfasst, der Folgendes umfasst:

- eine Vielzahl von Vakuumanschlüssen (738), die durch die Auflagefläche hindurchgehen und in einem vorher festgelegten Muster in ihr angeordnet sind;
- eine Vorrichtung zum Ansaugen von Luft durch jeden der Vielzahl von Vakuumanschlüssen, um das Medienblatt auf der Auflagefläche zu halten; und
- einen Abfolgeverteiler (732), der zwischen der Luftansaugvorrichtung und der Vielzahl von Vakuumanschlüssen angeschlossen ist, um wahlweise Luft durch einen Teil der Vielzahl von Vakuumanschlüssen entsprechend der Größe des Medienblattes anzusaugen.

14. Belichtungssystem nach Anspruch 13, wobei die Vielzahl von Vakuumanschlüssen (738) in einer Vielzahl von Reihen angeordnet ist, wobei jede Reihe im Wesentlichen parallel zu der Ausrichtungsachse verläuft und ferner eine Steuerung (150) zum Steuern des Abfolgeverteilers (732) umfasst, so dass Luft kumulativ und nacheinander durch jede Reihe der Vielzahl von Reihen der Vakuumanschlüsse angesaugt wird, wenn die Rollenvorrichtung über jede der Vielzahl von Reihen streicht.

15. Belichtungssystem nach einem der vorhergehenden Ansprüche, wobei das Medienblatt ferner einen Justierungsrand enthält, der im Wesentlichen senkrecht zu dem vorderen Rand verläuft, wobei das Belichtungssystem ferner umfasst:

- eine weitere Vorrichtung für lagegenaue Ausrichtung, die so konfiguriert ist, dass sie mit dem Justierungsrand in Kontakt kommt, um anzuzeigen, wann das Medienblatt in der Belichtungsposition ist; und
- wobei die Belichtungsvorrichtung (154) so konfiguriert ist, dass sie das Medienblatt in einer vorbestimmten Entfernung von dem Justierungsrand mit dem Bild belichtet.

16. Belichtungssystem nach einem der vorhergehenden Ansprüche, wobei das Medienblatt einen Justierungsrand enthält, der im Wesentlichen senkrecht zu dem vorderen Rand verläuft, wobei das Belichtungssystem ferner umfasst:

- eine Vorrichtung (794) zum Bestimmen einer Position des Justierungsrandes; und
- wobei die Belichtungsvorrichtung (154) so konfiguriert ist, dass sie das Medienblatt in einer vorbestimmten Entfernung und Ausrichtung im Verhältnis zu der Position des Justierungsrandes mit dem Bild belichtet.

17. Verfahren zum Belichten, umfassend:

(a) Befestigen eines Medienblattes nahe seines vorderen Randes an Befestigungsvorrichtungen (420A bis 420G), die in einer Ladevorrichtung (162) enthalten und an einem Tragelement (430) der Ladevorrichtung angebracht sind;

(b) Vorwärtsbewegen des Medienblattes (144B1) mit der Ladevorrichtung (162) über eine Auflagefläche (157) in eine Belichtungsposition, wobei sich ein vorderer Rand (902) des Medienblattes (144B1) im Wesentlichen senkrecht zu einer Bewegungsrichtung des Medienblattes vorwärts bewegt;

(c) Verfahren des vorderen Randes (902) gegen eine Vorrichtung für lagegenaue Ausrichtung (708), die eine Ausrichtungsachse aufweist, bis das Medienblatt mit der Vorrichtung für lagegenaue Ausrichtung (708) in Kontakt kommt, wobei die Befestigungsvorrichtungen (420A bis 420G) im Verhältnis zu dem Tragelement (430) und im Verhältnis zueinander in der Bewegungsrichtung des Medienblattes zum Ausrichten des vorderen Randes an der Ausrichtungsachse beweglich sind; und

(d) Belichten des Medienblatts mit einem Bild durch eine Belichtungsvorrichtung (154), die so konfiguriert ist, dass das Medienblatt mit einem Bild belichtet wird, wobei das Bild in einer vorbestimmten Entfernung und Ausrichtung im Verhältnis zu der Ausrichtungsachse positioniert ist.

18. Verfahren zum Belichten nach Anspruch 17, ferner

die folgenden Schritte umfassend:

(a) Hochheben des vorderen Randes (902) weg von der Auflagefläche (157), während der vordere Rand über die Auflagefläche vorwärts bewegt wird; und

(b) Absenken des vorderen Randes (902) in Richtung der Auflagefläche (157), bevor der vordere Rand gegen die Vorrichtung für lagegenaue Ausrichtung (708) verfahren wird.

19. Verfahren zum Belichten nach einem der Ansprüche 17 oder 18, ferner den Schritt umfassend, den vorderen Rand (902) mit der Ladevorrichtung so lange weiter gegen die Vorrichtung für lagegenaue Ausrichtung (708) zu verfahren, bis der vordere Rand im Wesentlichen parallel zu der Ausrichtungsachse verläuft.

20. Verfahren zum Belichten nach einem der Ansprüche 17 bis 19, wobei die Vorrichtung für lagegenaue Ausrichtung (708) einen ersten und einen zweiten beweglichen Ausrichtungspunkt (719) zum Definieren der Ausrichtungsachse enthält, ferner die folgenden Schritte umfassend:

(a) Auswählen eines Medienblattes (144B1) entsprechend der Größe des aufzuzeichnenden Bildes vor dem Vorwärtsbewegen des Medienblattes; und

(b) Bewegen von mindestens dem ersten oder dem zweiten beweglichen Ausrichtungspunkt (719) entlang einer parallel zu der Ausrichtungsachse verlaufenden Achse, wodurch der Abstand zwischen dem ersten und zweiten Ausrichtungspunkt entsprechend der Größe des Medienblattes verändert wird.

21. Verfahren zum Belichten nach einem der Ansprüche 17 bis 20, ferner den Schritt umfassend, den vorderen Rand (902) an die Auflagefläche (157) anzudrücken, nachdem die Ladevorrichtung (162) das Medienblatt in der Belichtungsposition positioniert hat, wodurch Kontakt zwischen dem Medienblatt und der Auflagefläche (157) hergestellt wird.

22. Verfahren nach einem der Ansprüche 17 bis 21, wobei die Ladevorrichtung ferner eine Anpressrolle (660A bis 660D) umfasst und die Auflagefläche eine Vielzahl von Vakuumanschlüssen (738) enthält, die durch die Auflagefläche gehen und in Reihen parallel zu der Ausrichtungsachse angeordnet sind, eine Vorrichtung zum Ansaugen von Luft durch jeden der Vielzahl von Vakuumanschlüssen, um das Medienblatt auf der Auflagefläche zu halten, und einen Abfolgeverteiler (732), der zwischen der Luftansaugvorrichtung und der Vielzahl von Vakuumanschlüssen angeschlossen ist, um wahlweise Luft durch einen Teil der Vielzahl von Vakuumanschlüssen anzusaugen, ferner die folgenden Schritte umfassend:

(a) Luftansaugen durch eine Reihe der Vielzahl von Reihen der Vakuumanschlüsse (738) neben dem vorderen Rand (902), nachdem der vordere Rand auf die Auflagefläche (157) gepresst worden ist;

(b) Rollen über das Medienblatt mit der Anpressrolle (660A bis 660B), wodurch Kontakt zwischen dem Medienblatt und der Auflagefläche (157) hergestellt wird; und

(c) Steuern (150) des Abfolgeverteilers, um kumulativ oder nacheinander Luft durch jede Reihe der Vielzahl von Vakuumanschlüssen (660A-660B) anzusaugen, wenn die Rollenvorrichtungen über jede der Vielzahl von Reihen streicht.

23. Verfahren zum Belichten nach einem der Ansprüche 17 bis 22, wobei das Medienblatt einen im Wesentlichen senkrecht zu dem vorderen Rand (902) verlaufenden Justierungsrand enthält, ferner den Schritt des lagegenauen Ausrichtens des Justierungsrandes (794) an einer weiteren Vorrichtung für lagegenaue Ausrichtung (793) umfassend.

24. Verfahren zum Belichten nach Anspruch 23, das ferner den Schritt des Belichtens des Medienblatts mit dem Bild in einer vorbestimmten Entfernung von der weiteren Vorrichtung für lagegenaue Ausrichtung umfasst.

25. Verfahren zum Belichten nach einem der Ansprüche 17 bis 24, wobei das Medienblatt einen im Wesentlichen senkrecht zu dem vorderen Rand verlaufenden Justierungsrand enthält, ferner die Schritte umfassend:

(a) Bestimmen einer Position des Justierungsrandes (794); und

(b) Belichten des Medienblatts mit dem Bild in einer vorbestimmten Entfernung von der Position des Justierungsrandes (794).

**Revendications**

1. Système d'imagerie (100) comprenant :

- une feuille de support (144B1) à imager dans une position d'imagerie, ladite feuille de sup-

port comportant un bord avant (902) ;

- une surface d'appui (157) pour supporter ladite feuille de support dans ladite position d'imagerie durant l'opération d'imagerie ;
- un dispositif de repérage (708) comportant un axe de repérage configuré pour que ledit bord avant vienne à son contact pour indiquer lorsque ladite feuille de support se trouve dans ladite position d'imagerie ;
- un dispositif de chargement (162) pour acheminer ladite feuille de support à travers ladite surface d'appui, ledit bord avant étant sensiblement perpendiculaire à une direction de mouvement de ladite feuille de support en cheminement, jusqu'à ce que ledit bord avant soit calé contre ledit dispositif de repérage ;
- un dispositif d'imagerie (154) configuré pour exposer une image sur ladite feuille de support, ladite image étant placée à une distance et selon une orientation prédéterminées par rapport audit axe de repérage ;
- dans lequel ledit dispositif de chargement comporte une pluralité de dispositifs de fixation (420A-420G) montés sur un organe porteur (430) dudit dispositif de chargement pour fixer ladite feuille de support à proximité dudit bord avant,

**caractérisé en ce que**

lesdits dispositifs de fixation (420A-420G) sont configurés pour être mobiles par rapport audit organe porteur (430) et les uns par rapport aux autres dans ladite direction de mouvement de ladite feuille de support (144B1) pour aligner ledit bord avant (902) sur ledit axe de repérage.

2. Système d'imagerie selon la revendication 1, dans lequel lesdits dispositifs de fixation (420A-420G) sont configurés pour être mobiles de façon coulissante dans ladite direction de mouvement de ladite feuille de support (144B1).

3. Système d'imagerie selon l'une des revendications 1 ou 2, dans lequel ledit dispositif de chargement (162) soulève ledit bord avant (902) au-dessus de ladite surface d'appui (157) tout en acheminant ledit bord avant. (902) à travers ladite surface d'appui (157) et abaisse ledit bord avant (902) en direction de ladite surface d'appui (157) lorsque ledit bord avant s'approche dudit dispositif de repérage (708).

4. Système d'imagerie selon l'une des revendications précédentes, dans lequel ledit dispositif d'imagerie (154) est configuré pour balayer ladite feuille de support (144B1) à l'aide d'un faisceau d'exposition pour exposer ligne par ligne ladite image sur ladite feuille de support.

5. Système d'imagerie selon l'une des revendications précédentes, dans lequel ledit dispositif de repérage (708) comprend en outre une barre de repérage (718) comportant une surface de référence (721) pour définir ledit axe de repérage, ledit axe de référence étant placé par rapport à ladite surface d'appui (157) et audit dispositif d'imagerie (154) et étant configuré pour que ledit bord avant (902) vienne à son contact pour indiquer lorsque ladite feuille de support se trouve dans ladite position d'imagerie.

6. Système d'imagerie selon l'une des revendications précédentes, dans lequel ledit dispositif de chargement (162) aligne ledit bord avant (902) sensiblement parallèlement audit axe de repérage.

7. Système d'imagerie selon l'une des revendications précédentes, dans lequel ledit dispositif de repérage (708) comprend en outre des premier et deuxième éléments de repérage mobiles (719) configurés pour que ledit bord avant (902) vienne à leur contact et les déplace, et pour être limités par ladite surface de référence.

8. Système d'imagerie selon la revendication 7, dans lequel au moins un desdits premier et deuxième éléments de repérage mobiles (719) est mobile le long d'un axe parallèle audit axe de repérage pour modifier l'écartement entre lesdits premier et deuxième éléments de repérage mobiles (719) en fonction de la dimension de ladite feuille de support (144B1).

9. Système d'imagerie selon l'une des revendications précédentes, dans lequel ledit dispositif de repérage (708) comprend en outre des premier et deuxième points de repérage (719) pour définir ledit axe de repérage, lesdits premier et deuxième points étant configurés pour que ledit bord avant (902) vienne à leur contact lorsque ladite feuille de support se trouve dans ladite position d'imagerie.

10. Système d'imagerie selon la revendication 9, dans lequel au moins un desdits premier et deuxième points de repérage (719) est mobile le long d'un axe parallèle audit axe de repérage pour modifier l'écartement entre lesdits premier et deuxième points de repérage (719) en fonction de la dimension de ladite feuille de support.

11. Systèm d'imagerie selon l'une des revendications précédentes, dans lequel ladite pluralité de dispositifs de fixation (420A-420G) communiquent avec un dispositif séquenceur (410) pour aspirer de l'air à travers un nombre prédéterminé de ladite pluralité de dispositifs de fixation (420A-420G), ledit nombre prédéterminé correspondant à la largeur de ladite

feuille de support, de sorte que seuls ladite pluralité de dispositifs de fixation au contact de ladite feuille de support soient activés.

12. Système d'imagerie selon l'une des revendications précédentes, dans lequel ledit dispositif de chargement comprend en outre un rouleau de lissage (660A-660D) pour rouler contre ladite feuille de support après que ledit dispositif de chargement (162) a mis en place ladite feuille de support dans ladite position d'imagerie, en assurant ainsi le contact entre ladite feuille de support et ladite surface d'appui (157).

13. Système d'imagerie selon l'une des revendications précédentes, comprenant en outre un mécanisme de maintien pour maintenir ladite feuille de support sur ladite surface d'appui (157), comprenant :

- une pluralité d'orifices à dépression (738) traversant ladite surface d'appui et disposés sur celle-ci suivant un réseau prédéfini ;
- un dispositif d'aspiration d'air à travers chaque orifice de ladite pluralité d'orifices à dépression pour maintenir ladite feuille de support contre ladite surface d'appui ; et
- un distributeur séquenceur (732) raccordé entre ledit dispositif d'aspiration d'air et ladite pluralité d'orifices à dépression pour aspirer de façon sélective de l'air à travers une partie de ladite pluralité d'orifices à dépression en fonction de la dimension de ladite feuille de support.

14. Système d'imagerie selon la revendication 13, dans lequel ladite pluralité d'orifices à dépression (738) sont disposés selon une pluralité de rangées, chaque rangée étant sensiblement parallèle audit axe de repérage, et comprenant en outre une unité de commande (150) pour commander ledit distributeur séquenceur (732) de façon à aspirer de façon cumulée et séquentielle de l'air à travers chaque rangée de ladite pluralité de rangées desdits orifices à dépression lorsque ledit dispositif à rouleaux passe par-dessus chacune de ladite pluralité de rangées.

15. Système d'imagerie selon l'une des revendications précédentes, dans lequel ladite feuille de support comporte en outre un bord de justification sensiblement perpendiculaire audit bord avant, ledit système d'imagerie comprenant en outre :

- un autre dispositif de repérage configuré pour que ledit bord de justification vienne à son contact pour indiquer lorsque ladite feuille de support se trouve dans ladite position d'imagerie ; et
- dans lequel ledit dispositif d'imagerie (154) est configuré pour exposer ladite image sur ladite feuille de support à une distance prédéterminée dudit bord de justification.

16. Système d'imagerie selon l'une des revendications précédentes, dans lequel ladite feuille de support comporte un bord de justification sensiblement perpendiculaire audit bord avant, ledit système d'imagerie comprenant en outre :

- un dispositif (794) pour déterminer une position dudit bord de justification ; et
- dans lequel ledit dispositif d'imagerie (154) est configuré pour exposer ladite image sur ladite feuille de support à une distance et selon une orientation prédéterminées par rapport à ladite position dudit bord de justification.

17. Procédé d'imagerie, comprenant :

(a) la fixation d'une feuille de support, à proximité de son bord avant, à des dispositifs de fixation (420A-420G) incorporés dans un dispositif de chargement (162) et montés sur un organe porteur (430) dudit dispositif de chargement ;
(b) l'acheminement de ladite feuille de support (144B1) à l'aide dudit dispositif de chargement (162) à travers une surface d'appui (157) jusqu'à une position d'imagerie, un bord avant (902) de ladite feuille de support (144B1) cheminant sensiblement perpendiculairement à une direction de mouvement de ladite feuille de support ;
(c) l'entraînement dudit bord avant (902) contre un dispositif de repérage (708) comportant un axe de repérage jusqu'à ce que ladite feuille de support soit au contact dudit dispositif de repérage (708),
dans lequel lesdits dispositifs de fixation (420A-420G) sont mobiles par rapport audit organe porteur (430) et les uns par rapport aux autres dans ladite direction de mouvement de ladite feuille de support pour aligner ledit bord avant sur ledit axe de repérage ; et
(d) l'exposition d'une image sur ladite feuille de support à l'aide d'un dispositif d'imagerie (154) configuré pour exposer une image sur ladite feuille de support, ladite image étant placée à une distance et selon une orientation prédéterminées par rapport audit axe de repérage.

18. Procédé d'imagerie selon la revendication 17, comportant en outre les étapes de :

(a) soulèvement dudit bord avant (902) à l'écart de ladite surface d'appui (157) pendant l'acheminement dudit bord avant à travers ladite surface d'appui ; et
(b) abaissement dudit bord avant (902) en di-

rection de ladite surface d'appui (157) avant l'entraînement dudit bord avant contre ledit dispositif de repérage (708).

19. Procédé d'imagerie selon l'une des revendications 17 ou 18, comprenant en outre l'étape de poursuite de l'entraînement dudit bord avant (902) contre ledit dispositif de repérage (708) à l'aide dudit dispositif de chargement jusqu'à ce que ledit bord avant soit sensiblement parallèle audit axe de repérage.

20. Procédé d'imagerie selon l'une des revendications 17 à 19, dans lequel ledit dispositif de repérage (708) comporte des premier et deuxième points de repérage mobiles (719) pour définir ledit axe de repérage, comprenant en outre les étapes de :

(a) sélection d'une feuille de support (144B1) en fonction de la dimension de l'image à enregistrer avant l'acheminement de ladite feuille de support ; et
(b) déplacement d'au moins un desdits premier et deuxième points de repérage mobiles (719) le long d'un axe parallèle audit axe de repérage, pour modifier ainsi l'écartement entre lesdits premier et deuxième points de repérage en fonction de la dimension de ladite feuille de support.

21. Procédé d'imagerie selon l'une des revendications 17 à 20, comprenant en outre l'étape consistant à forcer ledit bord avant (902) contre ladite surface d'appui (157) après que ledit dispositif de chargement (162) a placé ladite feuille de support dans ladite position d'imagerie, en assurant ainsi le contact entre ladite feuille de support et ladite surface d'appui (157).

22. Procédé selon l'une des revendications 17 à 21, dans lequel ledit dispositif de chargement comprend en outre un rouleau de lissage (660A-660D) et ladite surface d'appui comporte une pluralité d'orifices à dépression (738) traversant ladite surface d'appui et disposés en rangées parallèlement audit axe de repérage, un dispositif d'aspiration d'air à travers chaque orifice de ladite pluralité d'orifices à dépression pour maintenir ladite feuille de support contre ladite surface d'appui, et un distributeur séquenceur (732) raccordé entre ledit dispositif d'aspiration d'air et ladite pluralité d'orifices à dépression pour aspirer de façon sélective de l'air à travers une partie de ladite pluralité d'orifices à dépression, comprenant en outre les étapes de :

(a) aspiration d'air à travers une rangée de ladite pluralité de rangées dedits orifices à dépression (738) adjacente audit bord avant (902) après que ledit bord avant a été comprimé sur ladite surface d'appui (157) ;
(b) passage dudit rouleau de lissage (660A-660B) sur ladite . feuille de support, en assurant ainsi le contact entre ladite feuille de support et ladite surface d'appui (157) ; et
(c) commande (150) dudit distributeur séquenceur de façon à aspirer de façon cumulée et séquentielle de l'air à travers chaque rangée de ladite pluralité d'orifices à dépression (660A-660B) lorsque lesdits dispositifs à rouleaux passe par-dessus chacune de ladite pluralité de rangées.

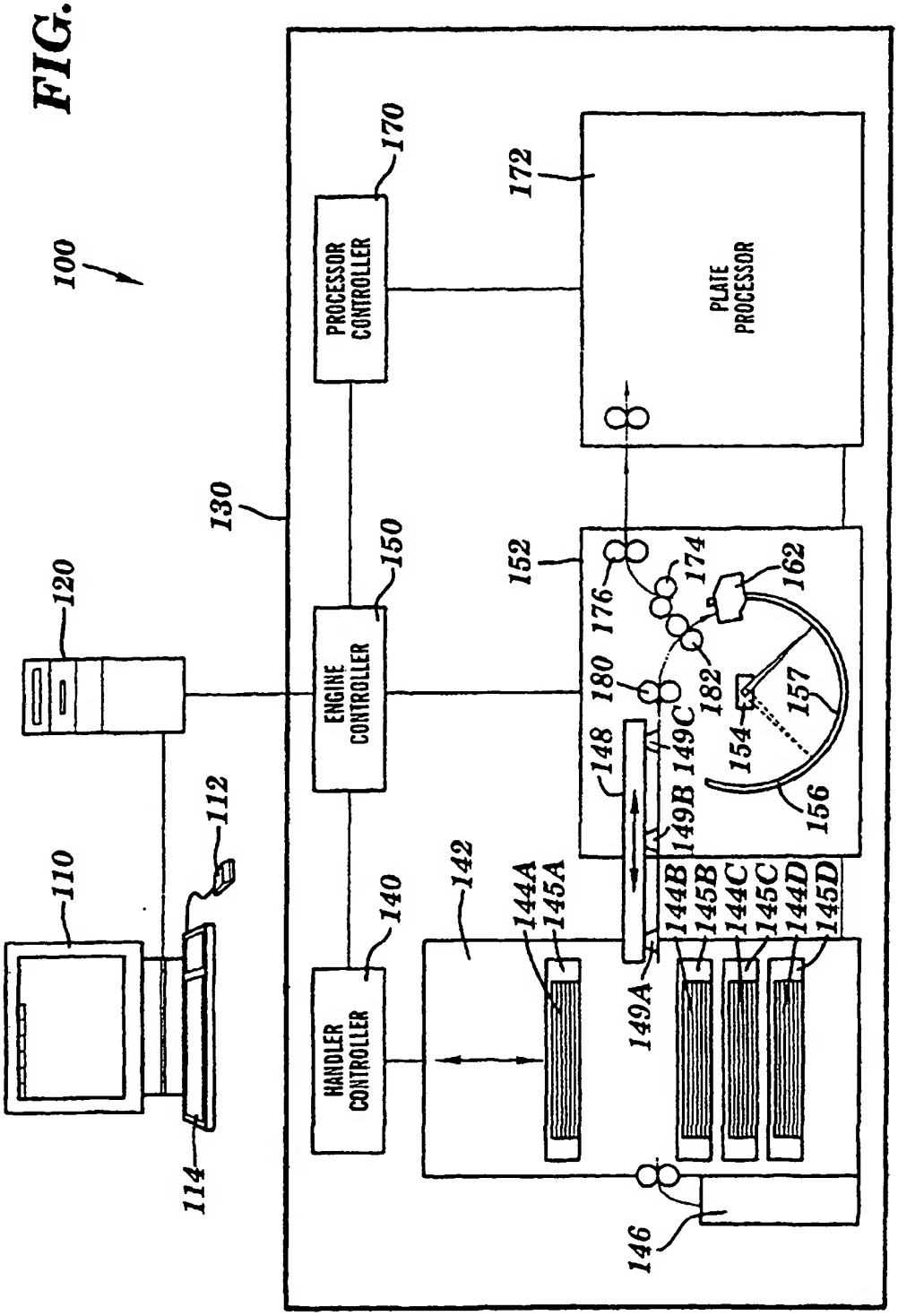
23. Procédé d'imagerie selon l'une des revendications 17 à 22, dans lequel ladite feuille de support comporte un bord de justification sensiblement perpendiculaire audit bord avant (902), et comprenant en outre l'étape de calage dudit bord de justification (794) sur un autre dispositif de repérage (793).

24. Procédé d'imagerie selon la revendication 23, comprenant en outre l'étape d'exposition de ladite image sur ladite feuille de support à une distance prédéterminée dudit autre dispositif de repérage.

25. Procédé d'imagerie selon l'une des revendications 17 à 24, dans lequel ladite feuille de support comporte un bord de justification sensiblement perpendiculaire audit bord avant, comprenant en outre les étapes de :

(a) détermination d'une position dudit bord de justification (794) ; et
(b) exposition de ladite image sur ladite feuille de support à une distance prédéterminée de ladite position dudit bord de justification (794).

FIG. 1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149B
149C
150
152
154
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157
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170
172
174
176
180
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HANDLER CONTROLLER
ENGINE CONTROLLER
PROCESSOR CONTROLLER
PLATE PROCESSOR

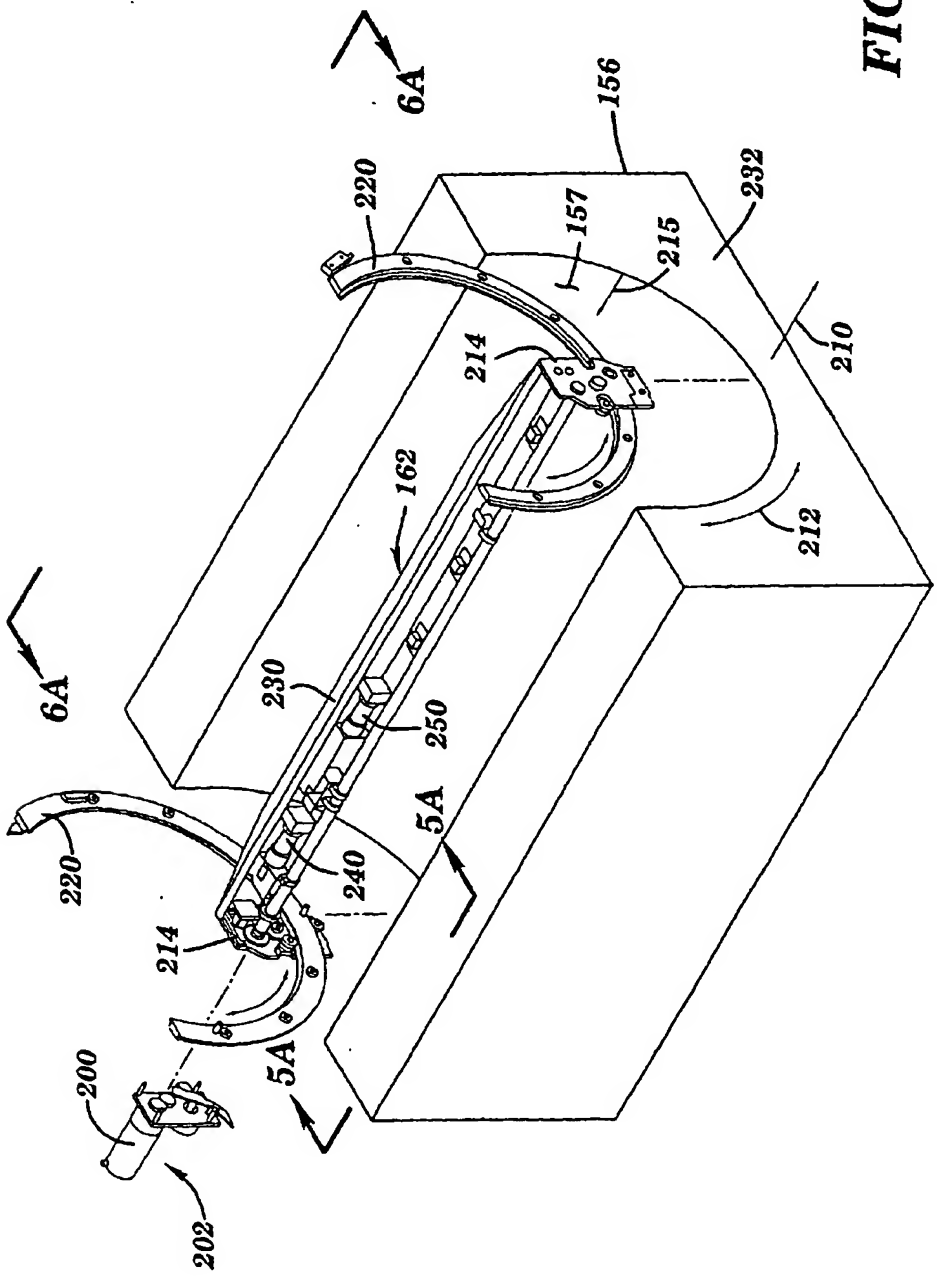
6A
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FIG. 2

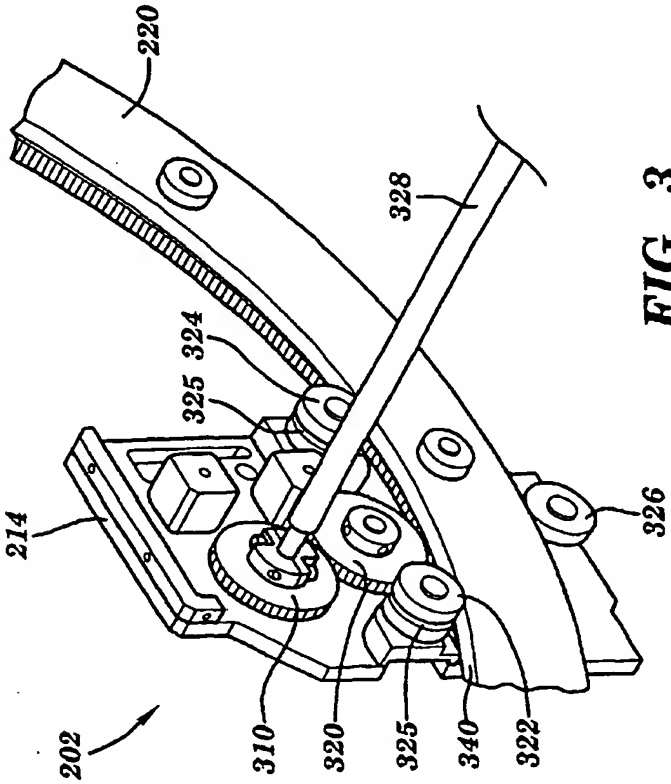
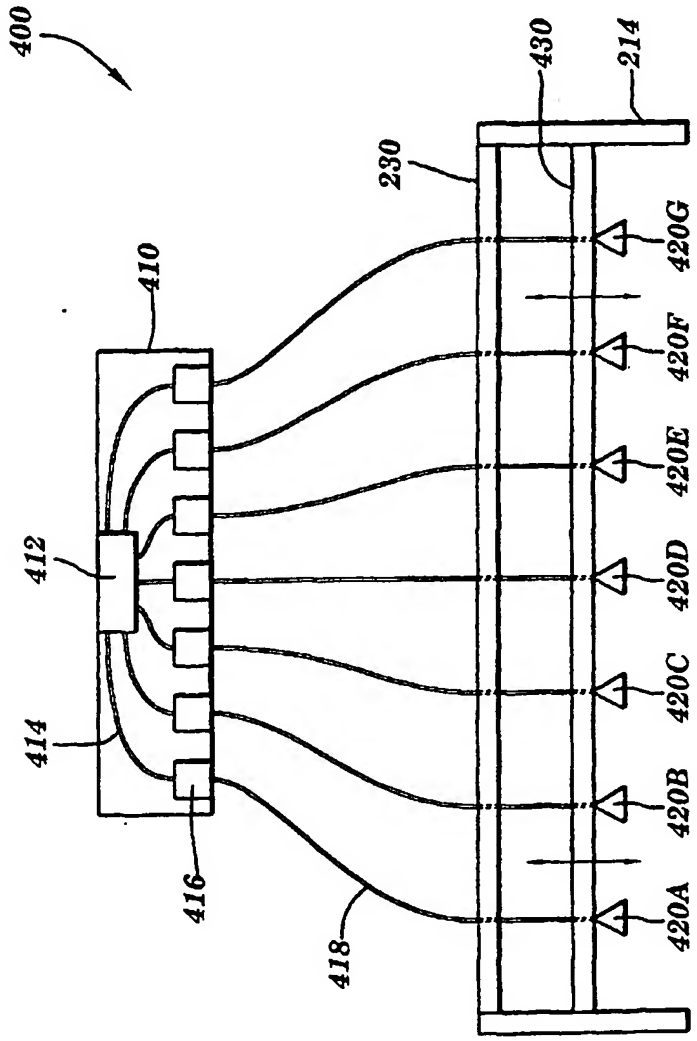



FIG. 3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420B
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412
414
416
418

FIG. 4

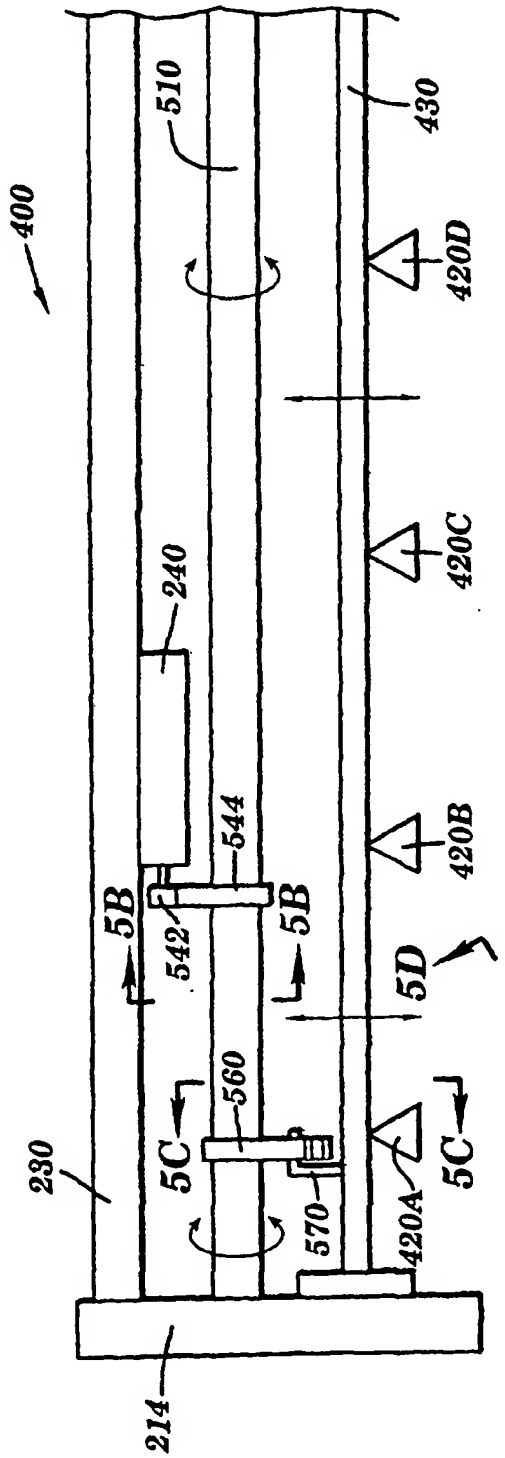



FIG. 5A

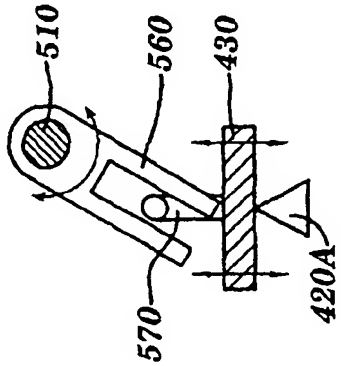



FIG. 5C

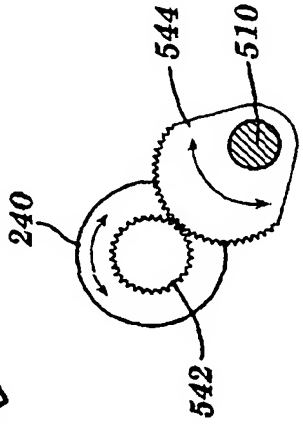



FIG. 5B

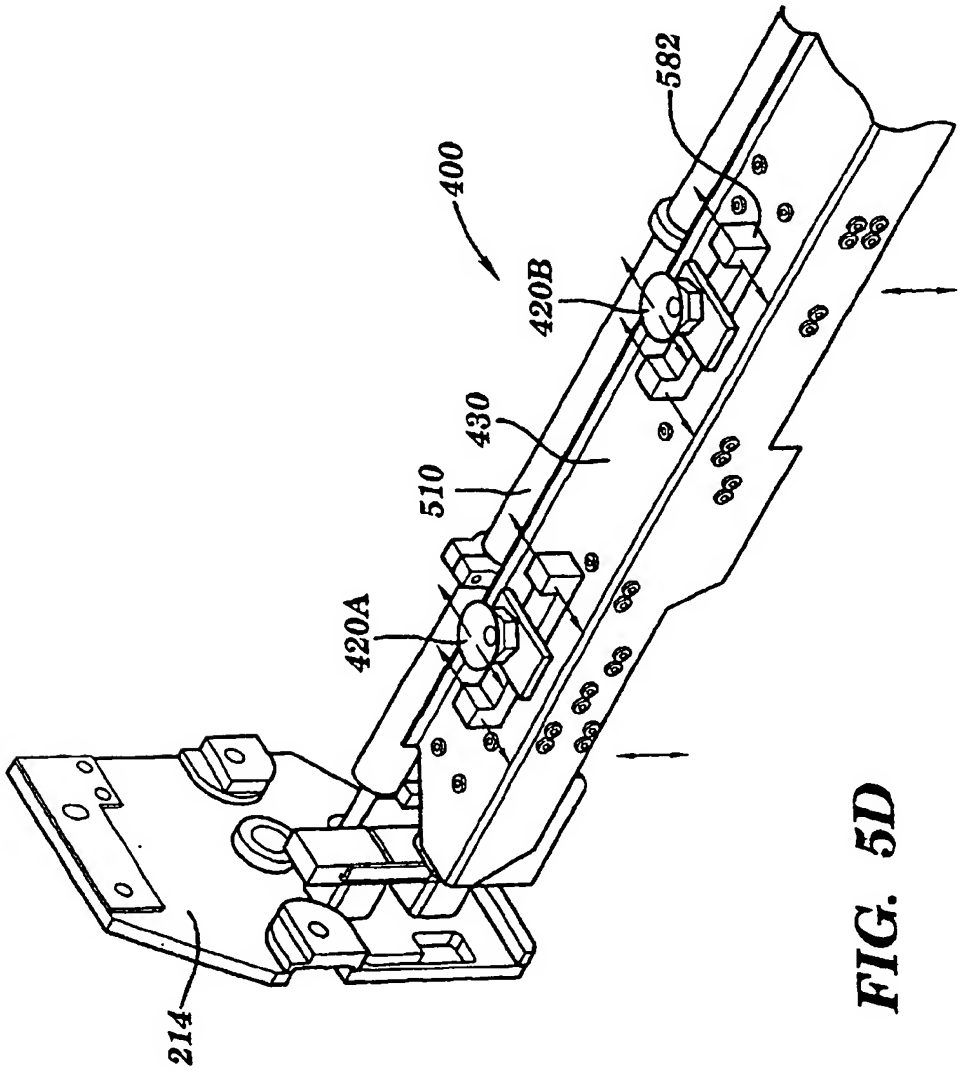



FIG. 5D

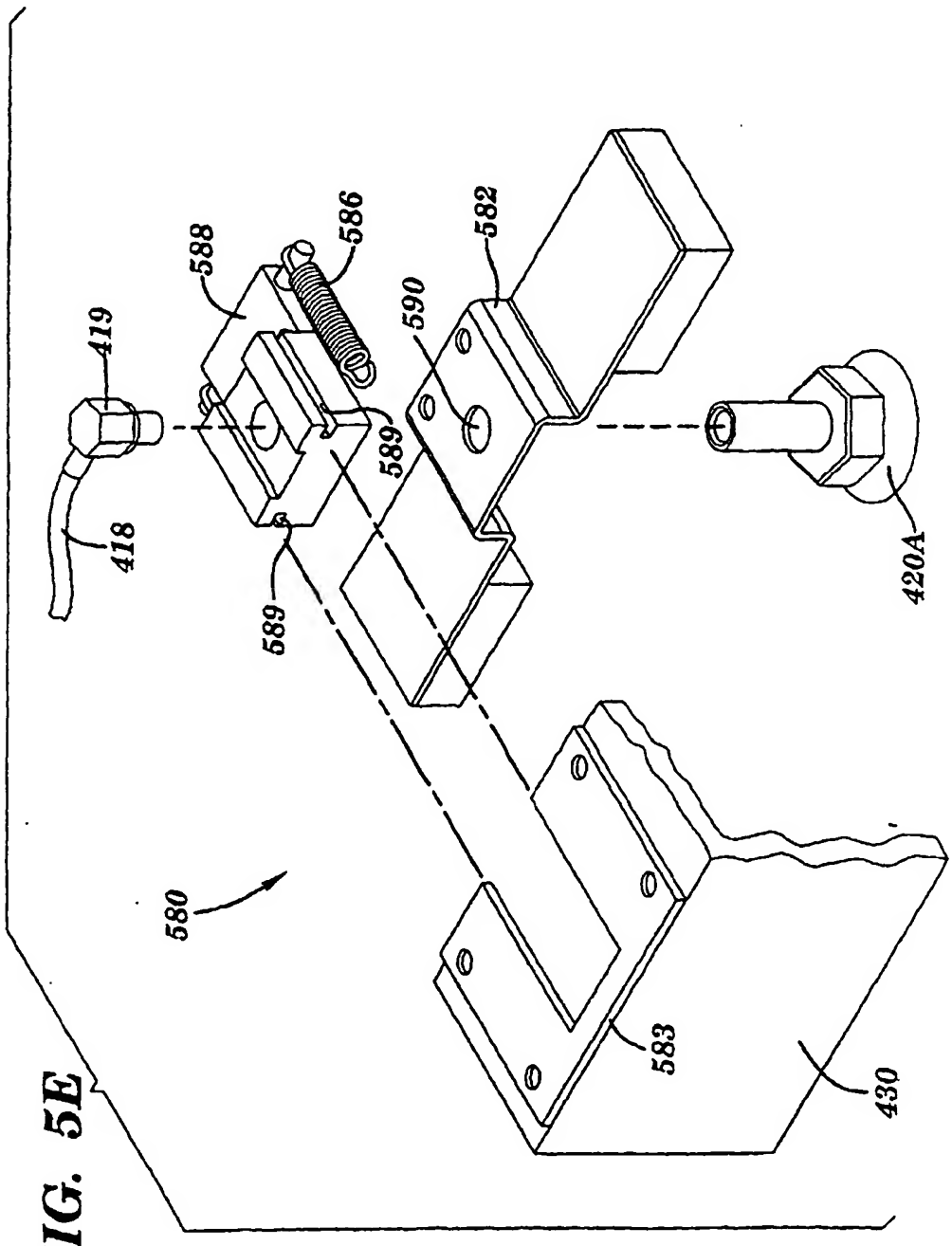



FIG. 5E

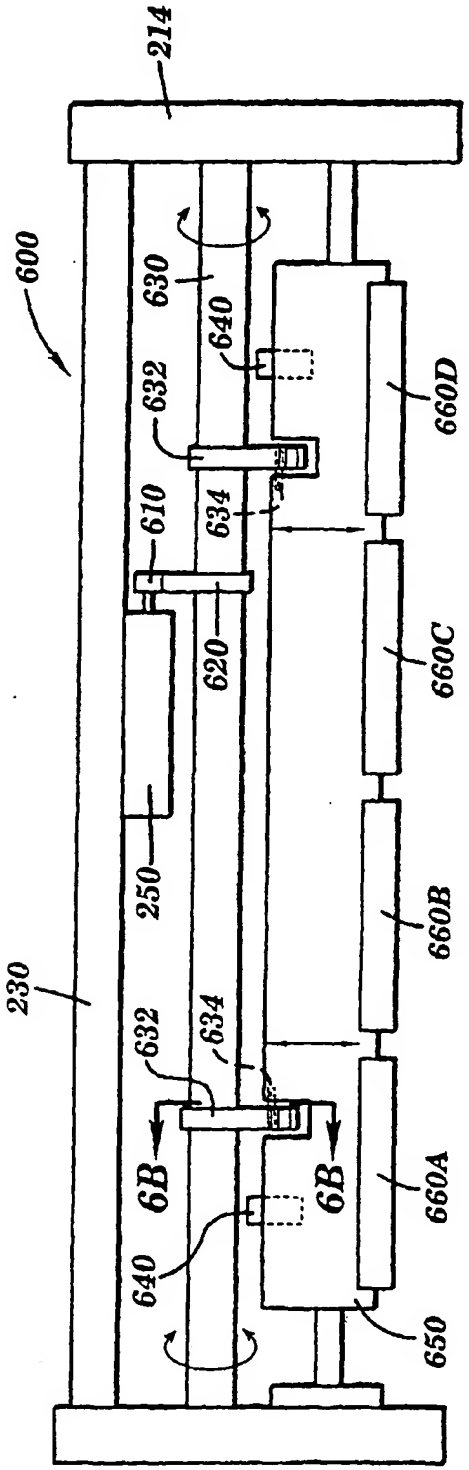



FIG. 6A

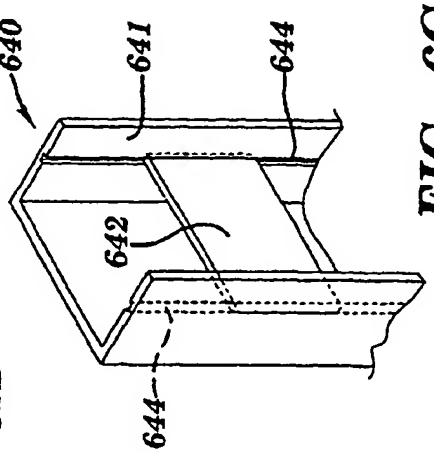



FIG. 6C

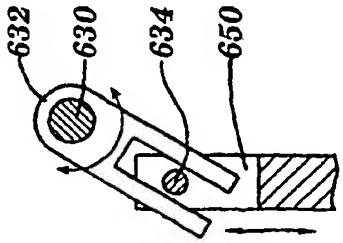



FIG. 6B

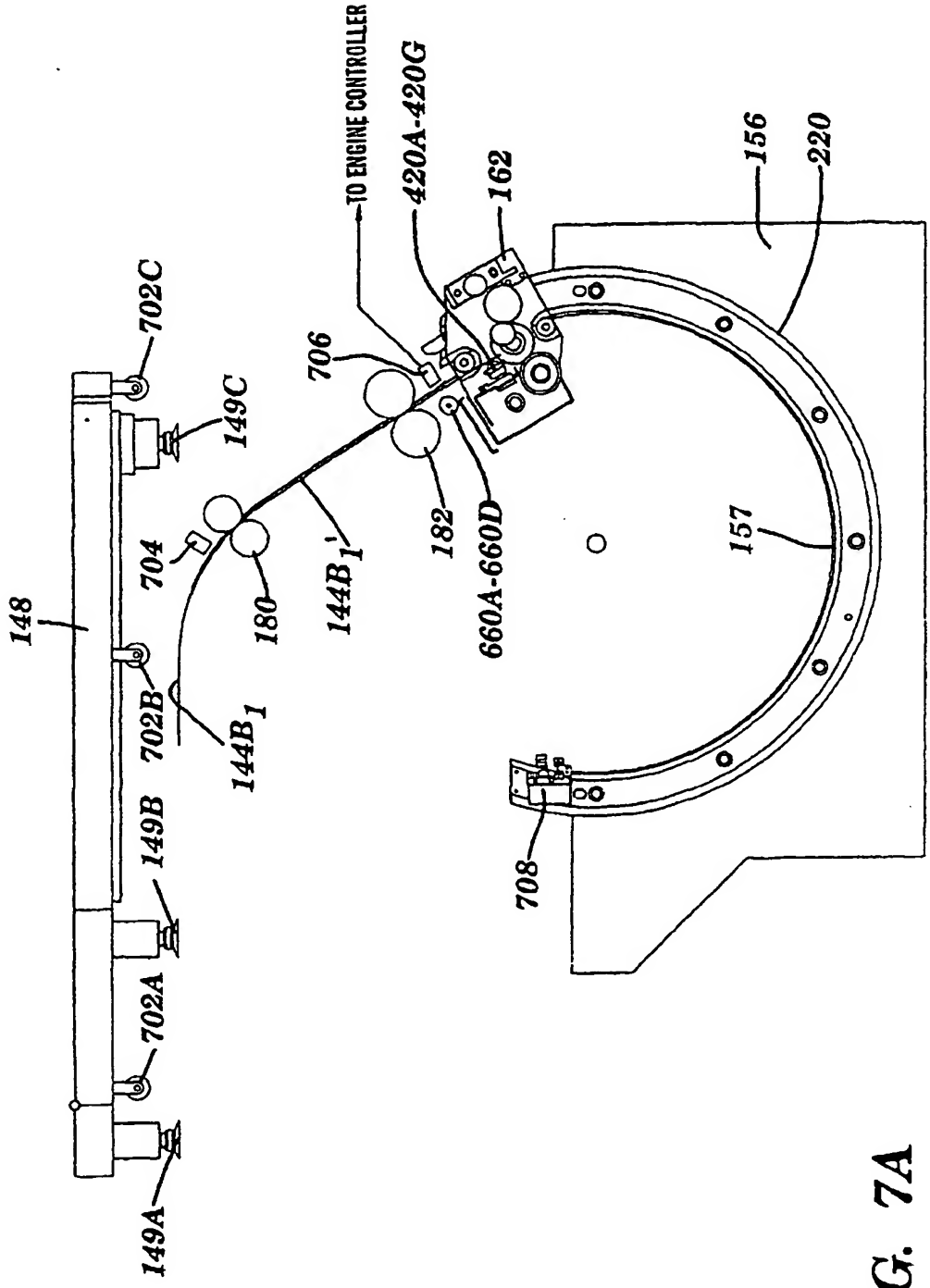

TO ENGINE CONTROLLER
420A-420G
162
156
220
702C
706
149C
704
148
180
144B1'
182
660A-660D
157
702B
144B1
149B
702A
708
149A

FIG. 7A

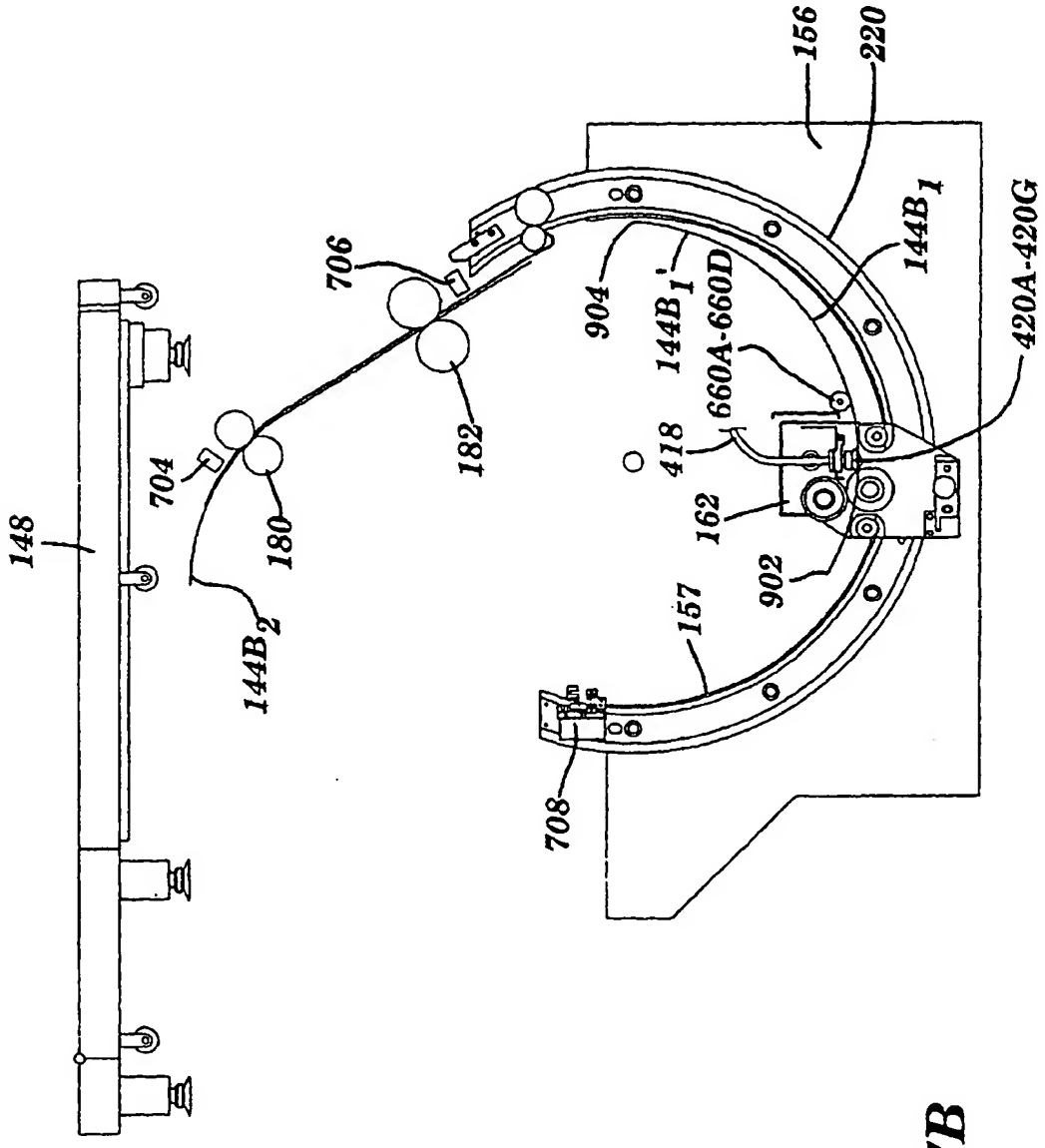

156
220
706
904
144B1'
144B1
420A-420G
660A-660D
182
418
704
148
180
162
902
144B2
157
708

FIG. 7B

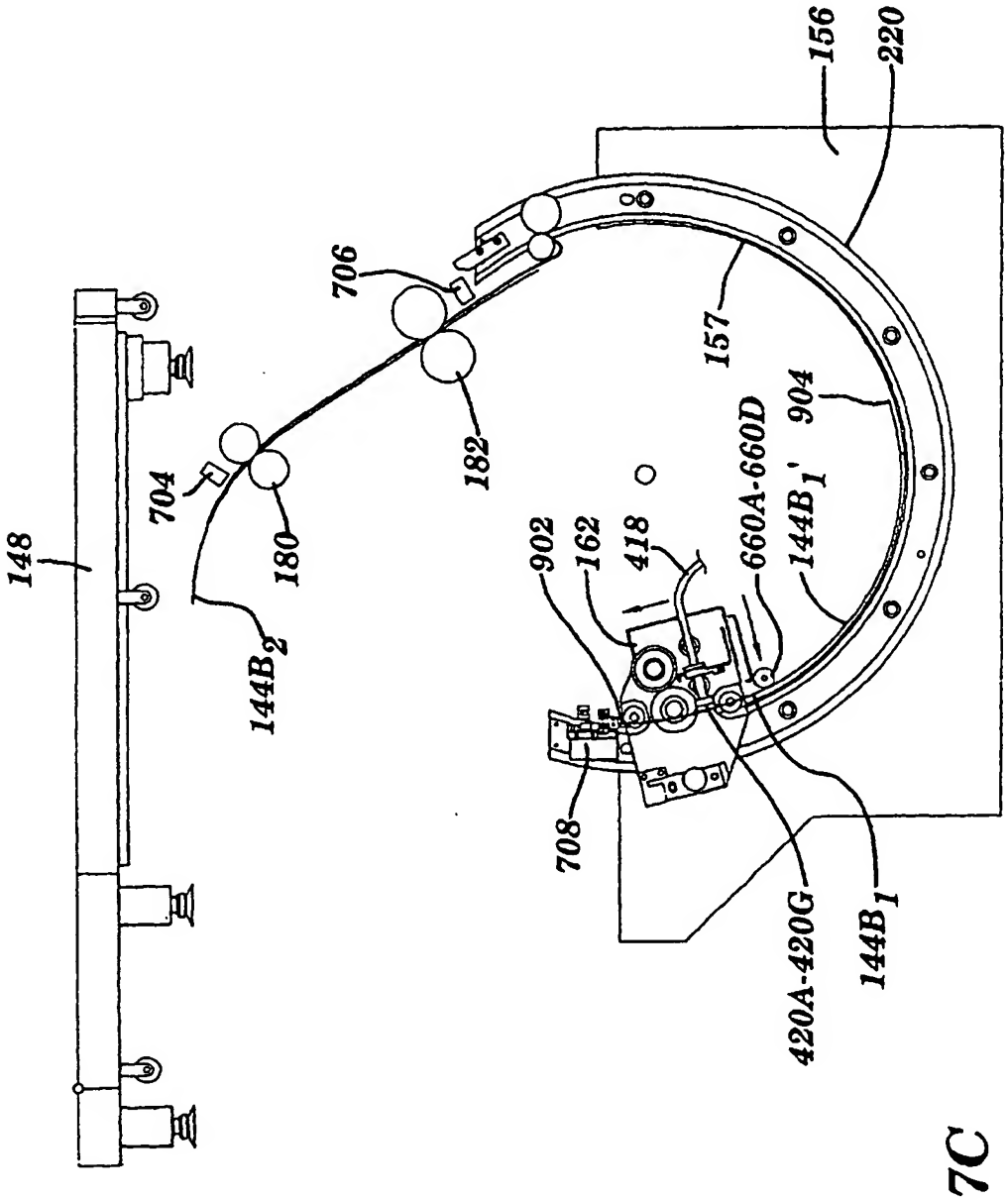
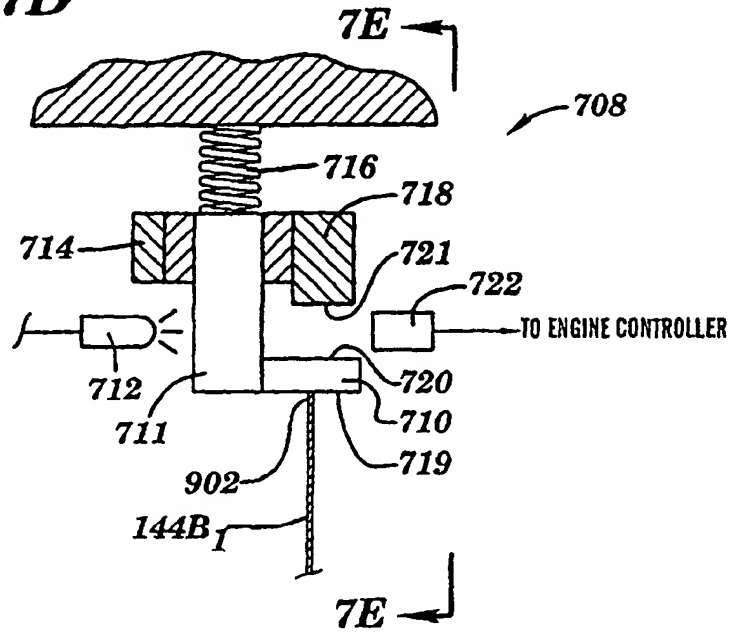

156
220
706
157
148
704
182
904
180
660A-660D
144B1'
902
162
418
144B2
708
420A-420G
144B1

FIG. 7C

FIG. 7D


7E
708
716
718
714
721
722
TO ENGINE CONTROLLER
712
720
711
710
902
719
144B1
7E

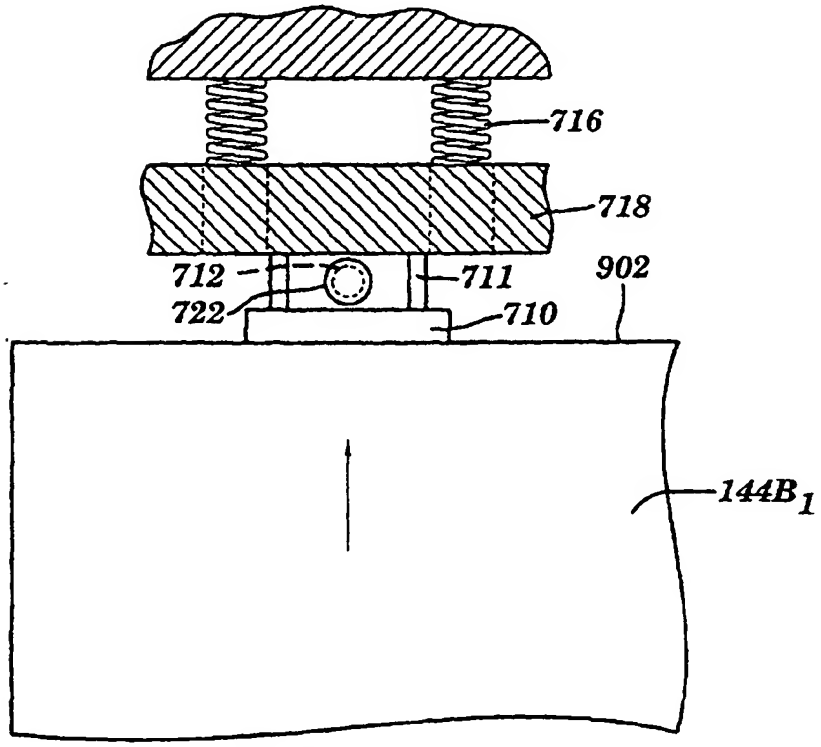

716
718
712
711
902
722
710
144B1

FIG. 7E

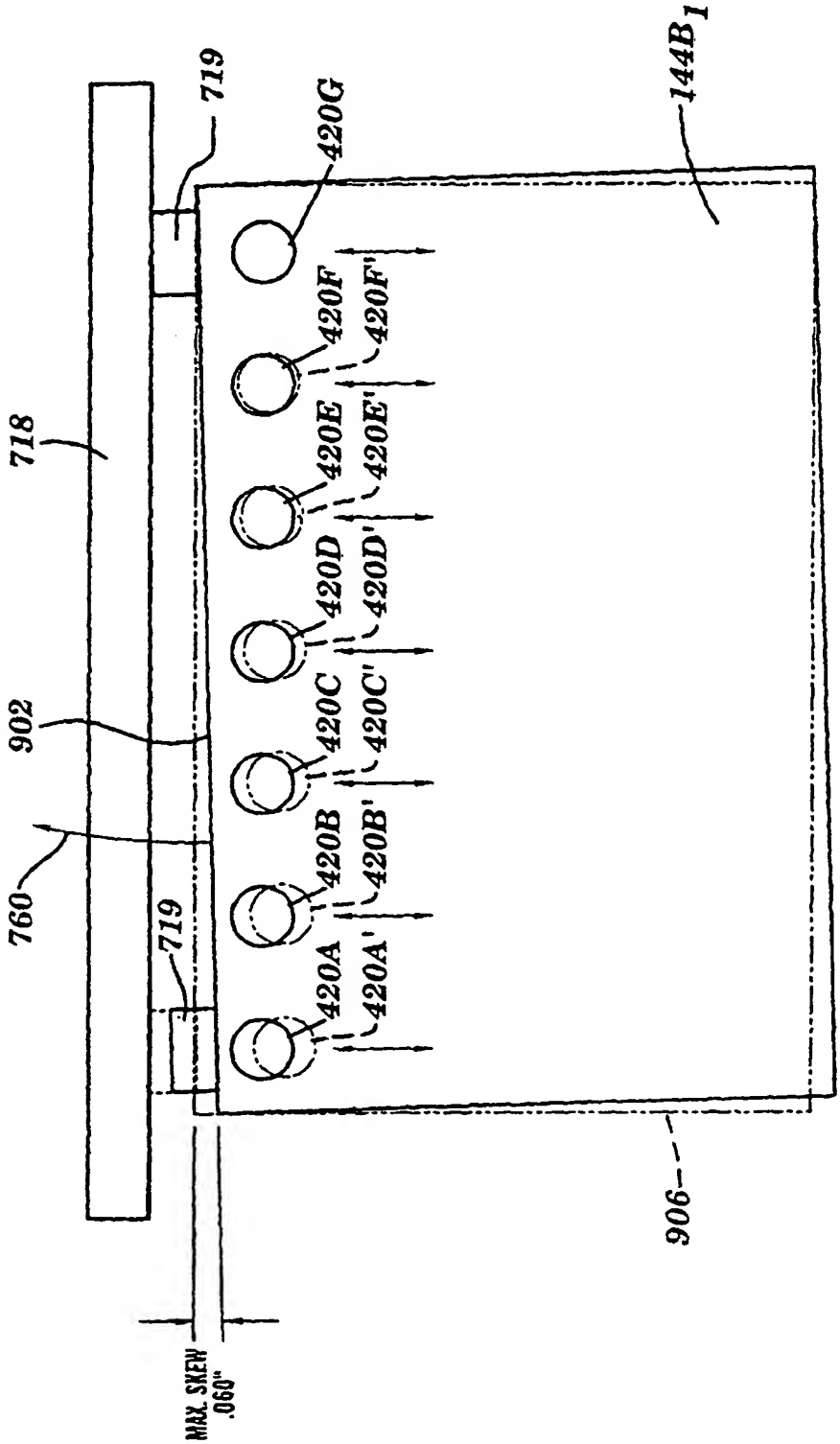

719
420G
144B1
718
420F
420F'
420E
420E'
420D
420D'
420C
420C'
902
420B
420B'
760
719
420A
420A'
210
906
MAX. SKEW
.060"

FIG. 7F

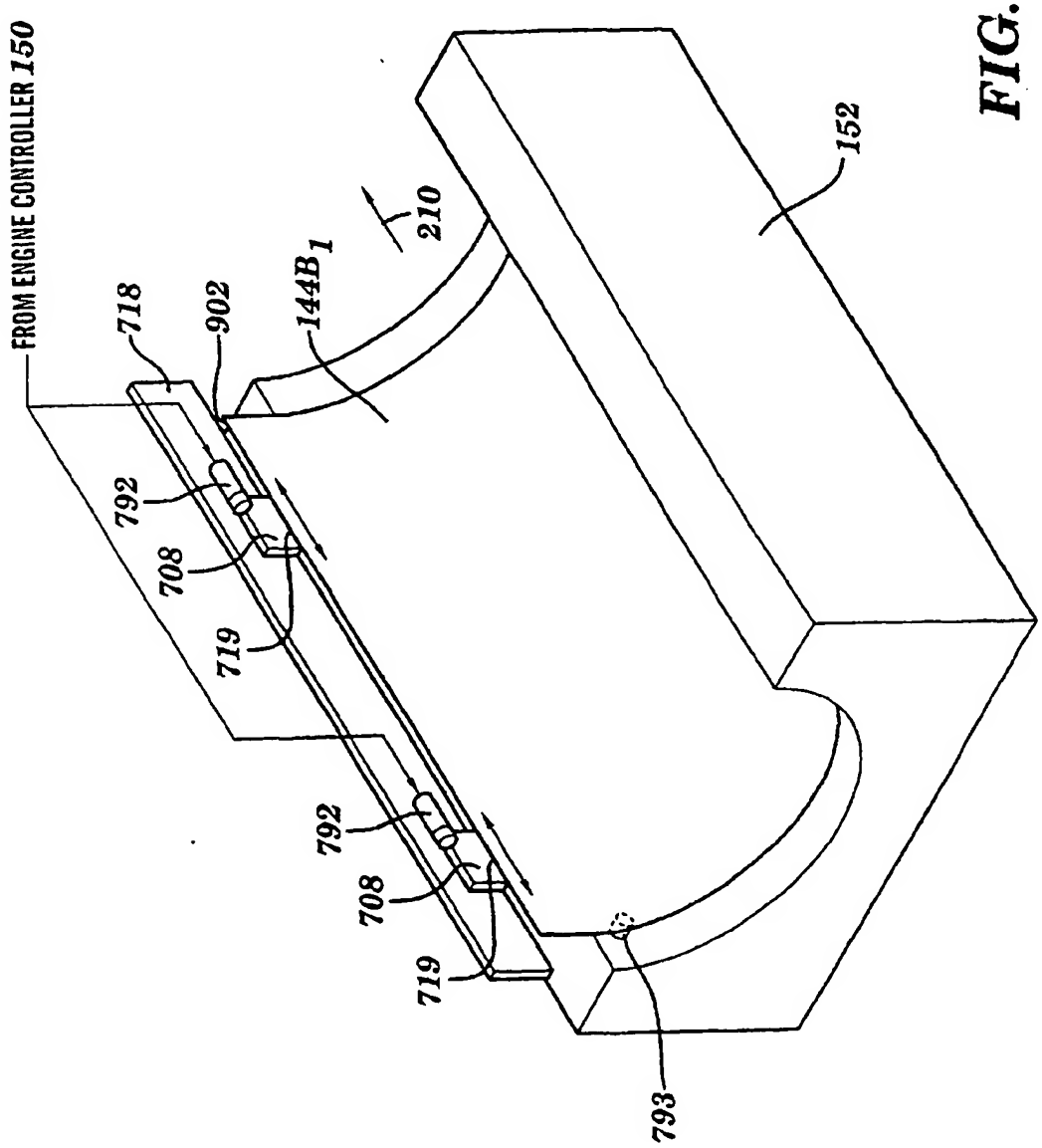

FROM ENGINE CONTROLLER 150
718
902
144B1
210
152
792
708
719
792
708
719
793

FIG. 7G

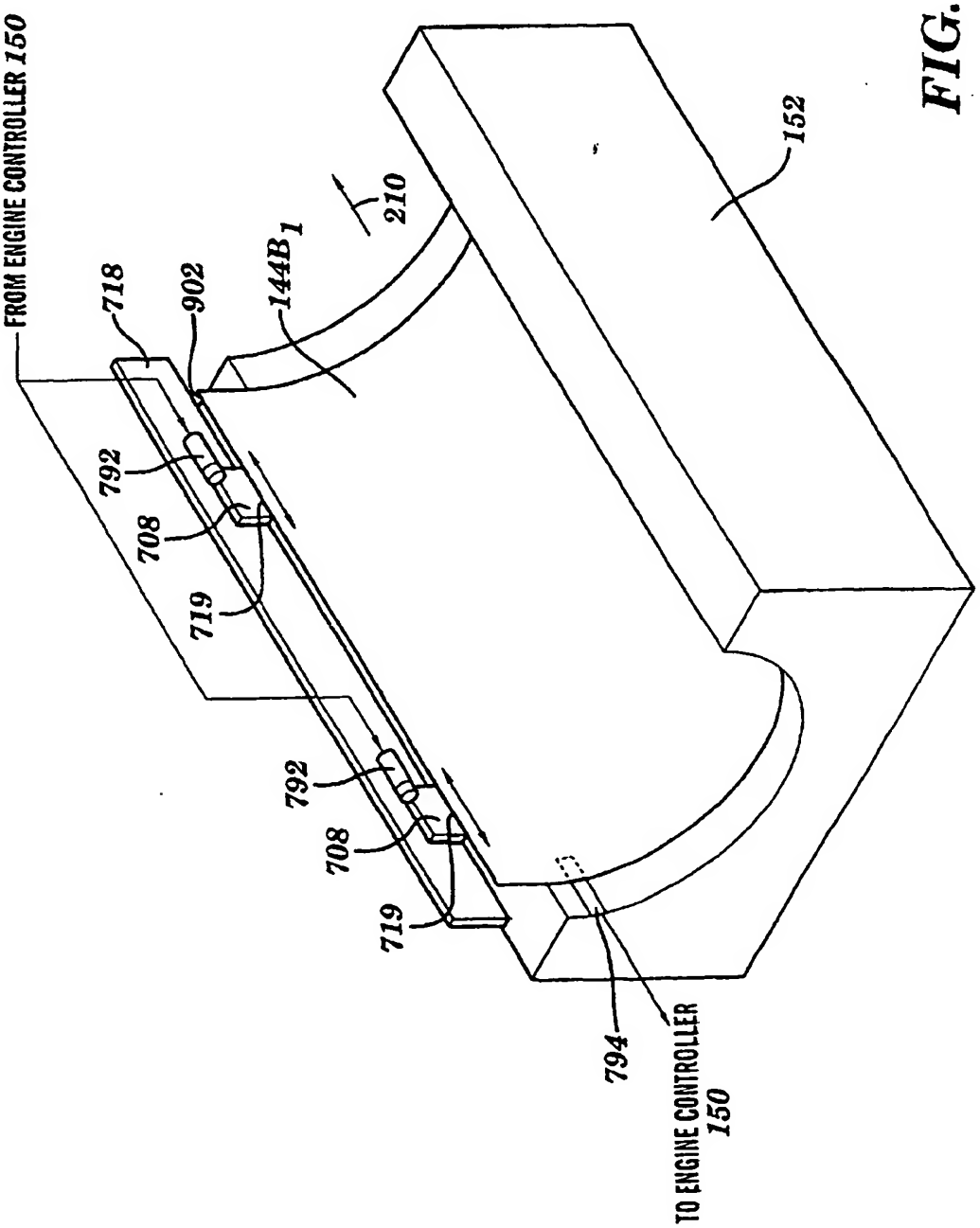

FROM ENGINE CONTROLLER 150
718
902
144B1
210
152
792
708
719
792
708
719
794
TO ENGINE CONTROLLER 150

FIG. 7H

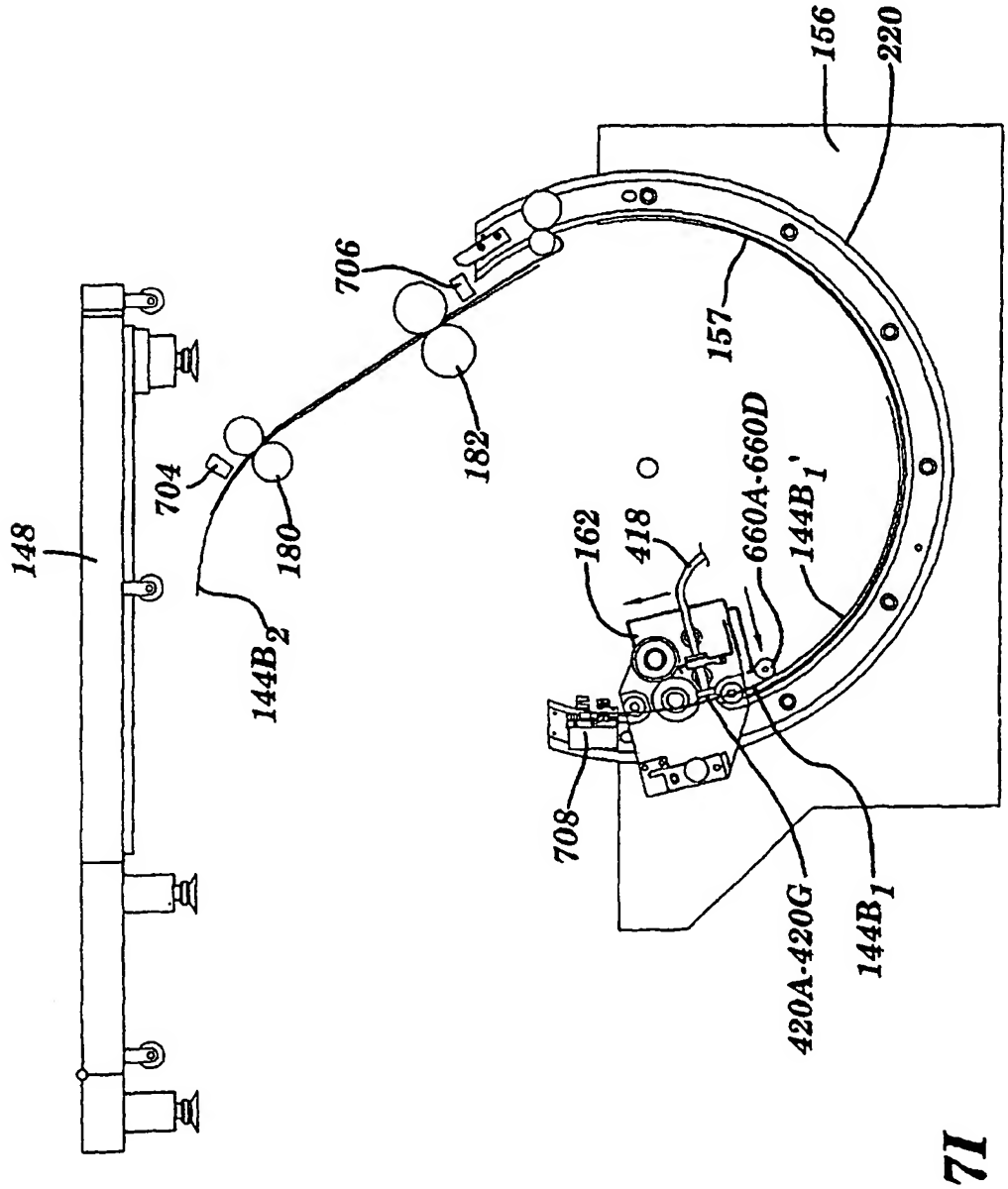

156
220
706
157
182
704
180
148
144B2
162
418
660A-660D
144B1'
708
420A-420G
144B1

FIG. 7I

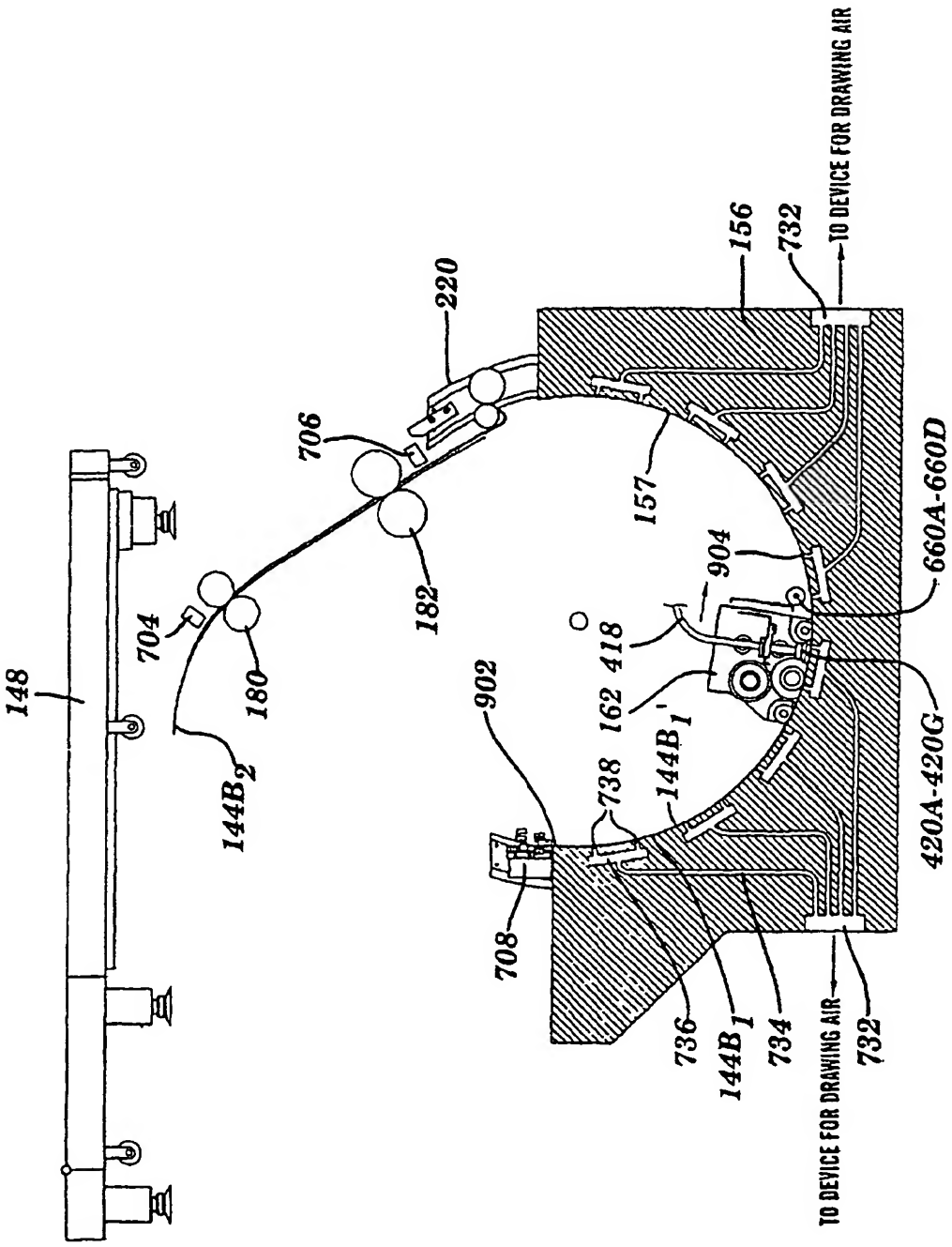

148
704
180
144B2
706
182
220
156
732
TO DEVICE FOR DRAWING AIR
157
660A-660D
904
418
162
144B1'
902
738
144B1
420A-420G
708
736
144B1
734
732
TO DEVICE FOR DRAWING AIR

FIG. 7J

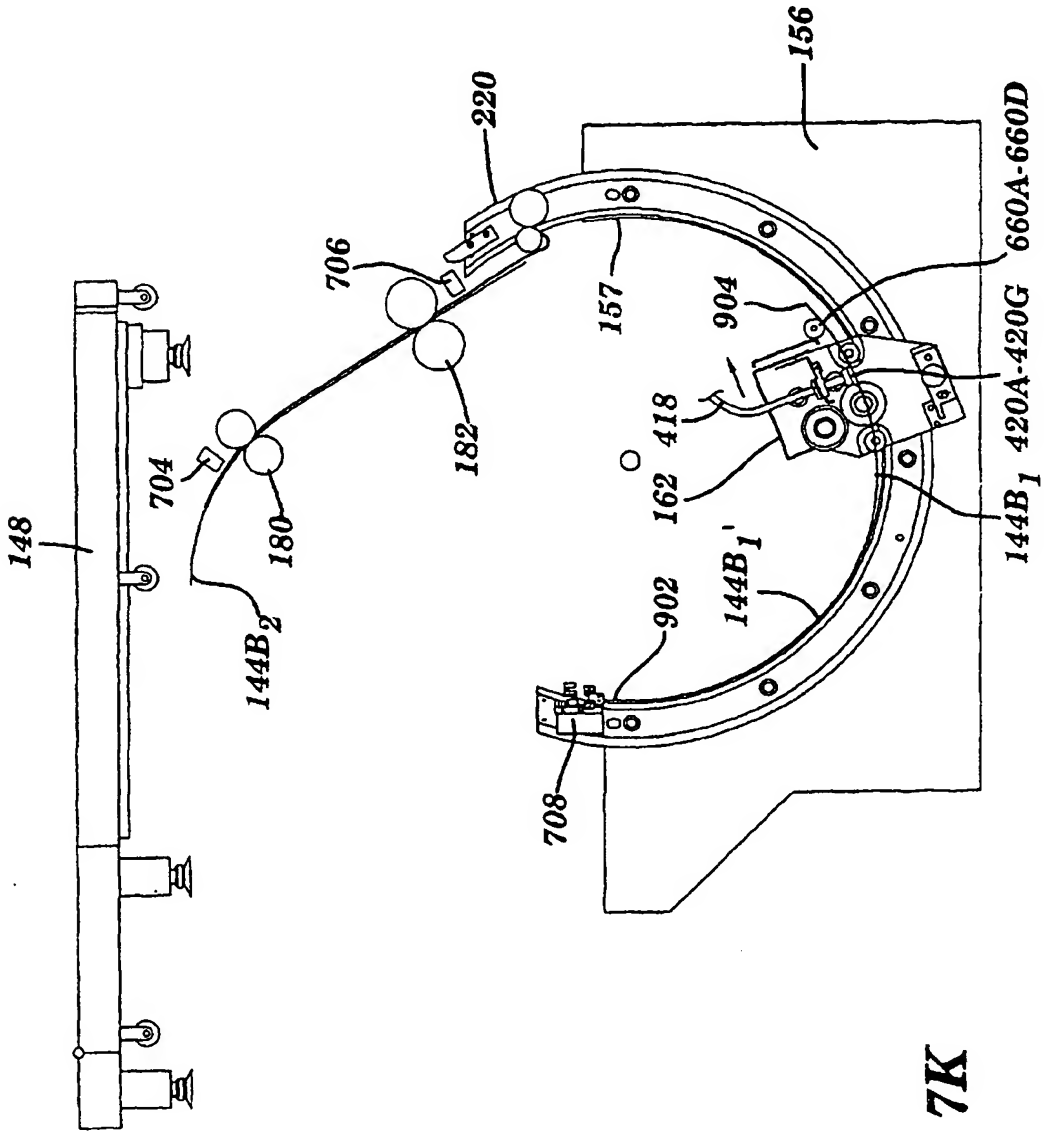

156
220
706
157
904
660A-660D
182
418
420A-420G
704
162
144B1
180
144B1'
148
902
144B2
708

FIG. 7K

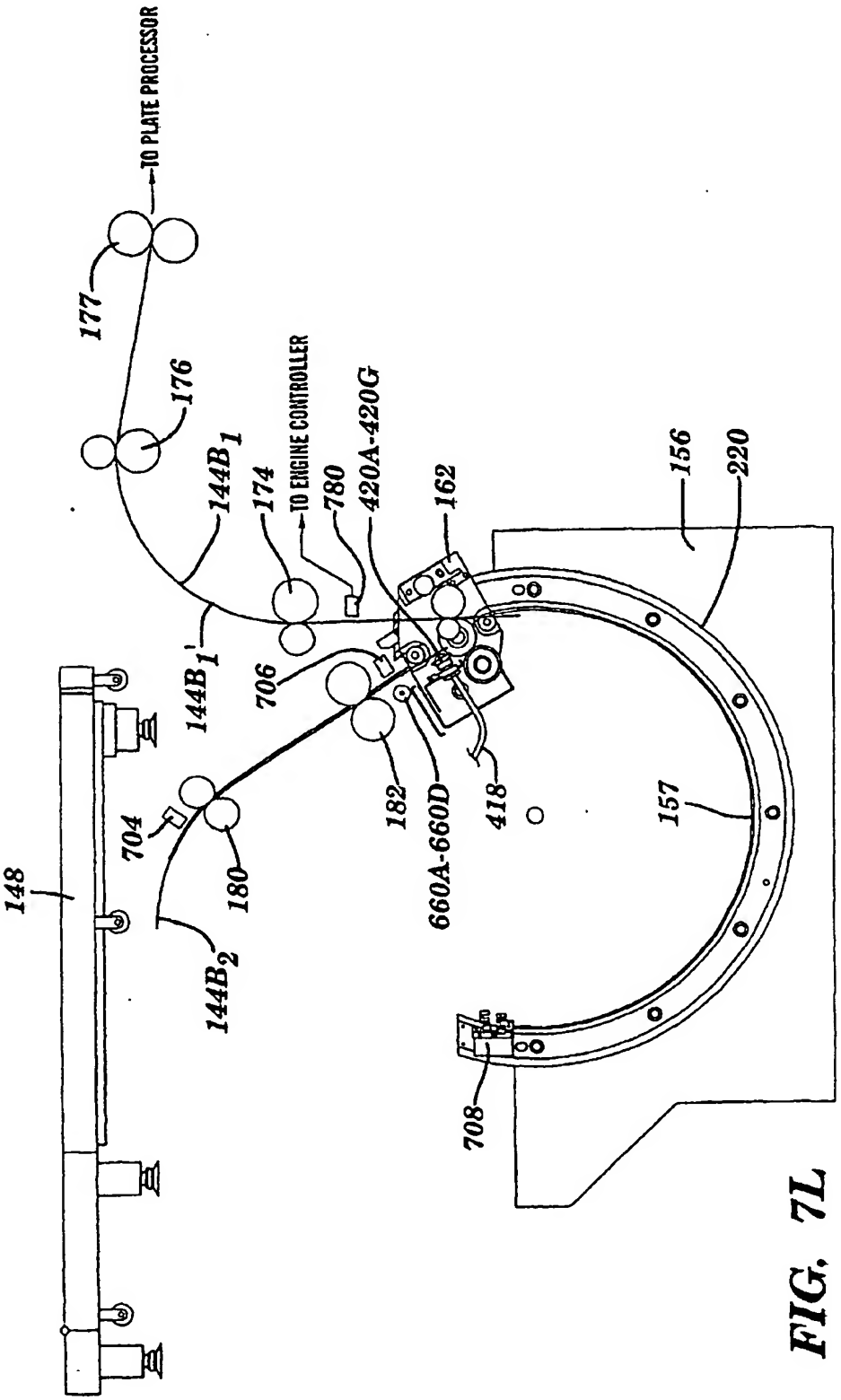

TO PLATE PROCESSOR
177
176
144B1
174
TO ENGINE CONTROLLER
780
420A-420G
162
156
220
144B1'
706
182
660A-660D
418
157
704
180
148
144B2
708

FIG. 7L

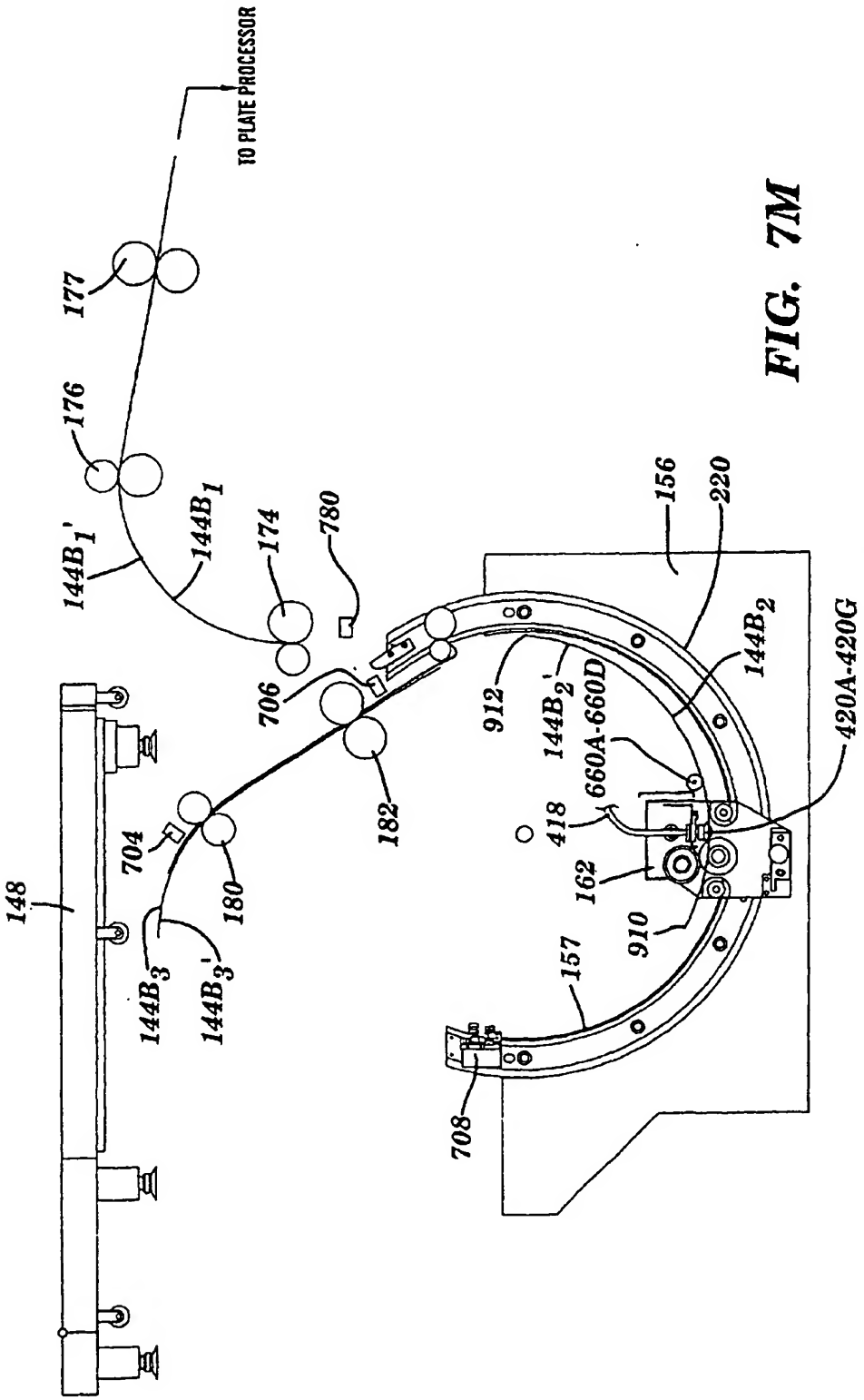

TO PLATE PROCESSOR
177
176
144B1'
144B1
174
780
706
182
704
180
144B3
144B3'
148
156
220
912
144B2'
144B2
660A-660D
420A-420G
418
162
910
157
708

FIG. 7M

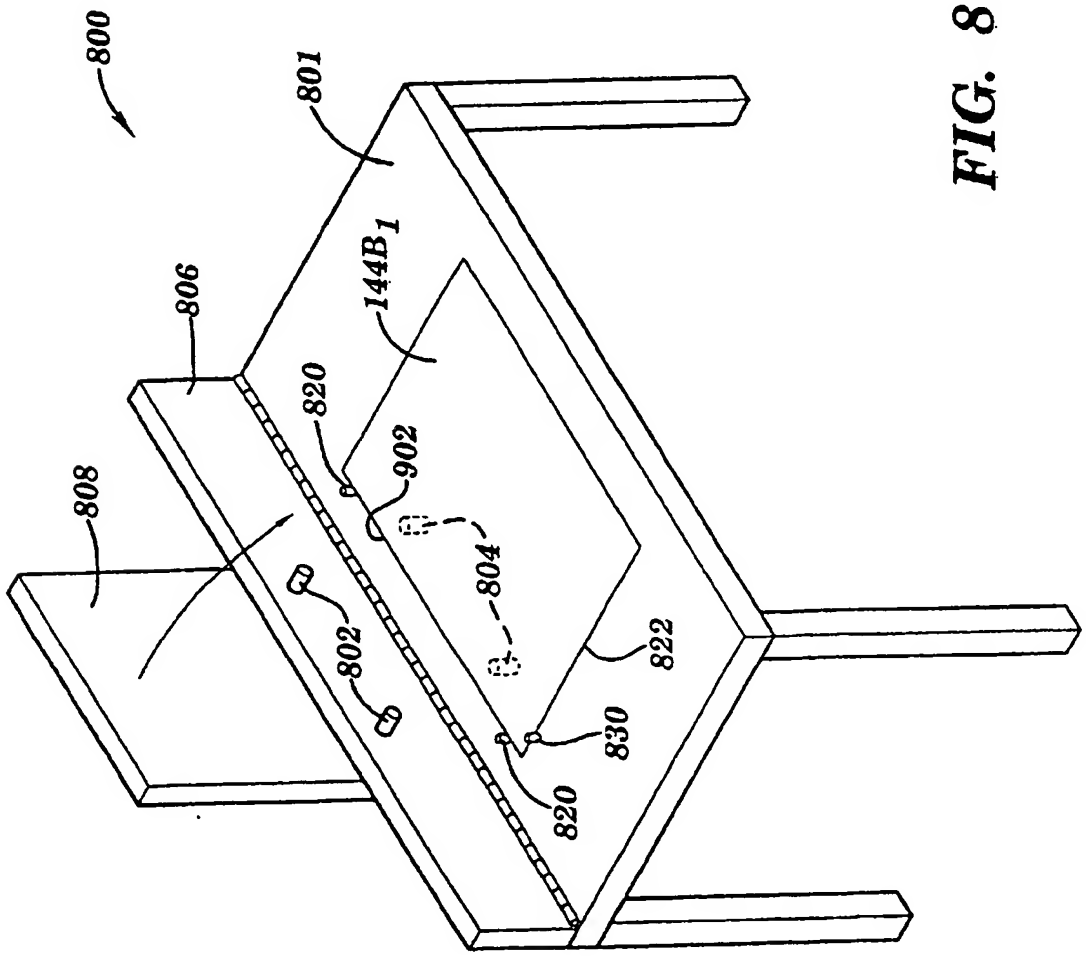



FIG. 8